Railway Age

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FIRST HALF OF 1927—No. 16 NEW YORK—MARCH 19, 1927—CHICAGO SEVENTY-SECOND YEAR

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A Two-Car Mid-day Electric Suburban Train on the Illinois Central, Chicago—Photo by Ewing Galloway

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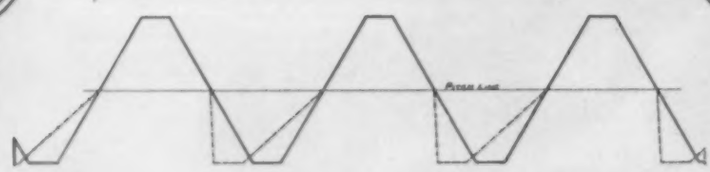

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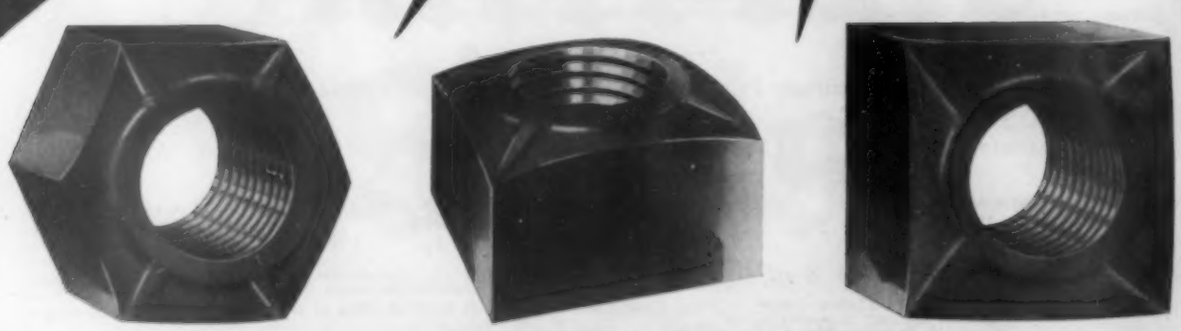

"The Nut with the Star Crown"

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Railway Age

Vol. 82, No. 16 March 19, 1927

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A Weekly Letter of Economies

ONE of the features that has been a part of the system of management of the mechanical department of the Lehigh Valley for a number of years is a weekly letter prepared by each shop superintendent and master mechanic for the information and guidance of the others. This letter is known as the weekly letter of economies and is a digest of the subjects discussed at the weekly meetings of the supervisory staffs at each shop and division point on the system. The superintendent of motive power keeps each shop superintendent and master mechanic informed as to the important problems affecting the mechanical department as a whole, in a weekly memorandum. This memorandum is read at the various staff meetings and constructive comments are noted. Local problems are also included in the programs of the staff meetings and the weekly letters include digests of all the subjects discussed, whether they pertain to the whole system or not. The advantage to each shop superintendent and master mechanic of having the information contained in these letters is obvious. It has been a considerable factor in obtaining excellent co-ordination between the various shops and repair points.

Early Annual Reports

WHEN railway men discuss reports and statistics one point that is invariably made is the necessity for promptitude in furnishing the figures to those who use them. Statistics, it is repeatedly asserted, are valueless if they are made available too long after the performance to which they relate has taken place. Why should not the same arguments apply to information furnished the stockholder? Presumably he would like to have the information about the earnings of the railroad in which he is interested as promptly as possible without having to wait until the annual report has become a mere historical document of reference and the "news value" has disappeared. Many railroads are showing appreciation of this. Some are issuing so-called tabloid reports which can be mailed with dividend checks. These usually contain in small space a surprisingly large amount of useful information. Limitations of size require careful selection of material but, on the other hand, the reports are easy to prepare and can be made available months before the annual reports are ready. It will be noticed also that the tendency is for the annual reports to stockholders to be made public earlier than formerly. This year, as in former years, the Great Northern was the first to mail its tabloid report, which it sent out with the February 1 dividend checks. The first complete report was the Buffalo, Rochester & Pittsburgh and a third that of the Gulf, Mobile & Northern. The New York Central issued an interesting tabloid report containing the earnings statements of the parent company and the three important subsidiary companies. The Baltimore & Ohio and the Chicago, Rock Island & Pacific each continued the policy of sending out interesting synopses.

A Railroad Novel

THE public comes to know of any industry or field of endeavor a little more than vaguely through ordinary means of publicity. It may be the paid advertisement that begins the greater dissemination of facts, or it may be the free publicity of the newspaper, or by word of mouth. There is a third manner in which the layman adds a little more to his general knowledge—by reading fiction of the modern, realistic school which, whatever it may do, does apparently attempt to build its industrial and commercial backgrounds with no small degree of accuracy. The business of advertising, the medical profession, manufacturing, selling, and the work of getting out newspapers have all been made a little clearer to the laymen through the appearance of novels in which the characters moved against a background of industry or commercial endeavor that was real. In this day when the railroads are doing so much to make their situation and their problems clear to the public, it would be an advantage to them to have competent novelists realize the wealth of material and opportunity for novels in the railroad field. With the public's interest already whetted on transportation matters, as it has been in recent years, the time would appear to be ripe for a successful and important novel of the railroads.

Hold the Phone to Your Mouth

THE voice with the smile wins, we are told. It is probably safe to say that railroad ticket sellers, information-bureau attendants, tracing clerks and others who have to answer large numbers of telephone inquiries are to be rated as high as any class of users—for distinctness of uttterance and prompt comprehension of questions they probably rate higher than most. Without any reflection on their abilities or their record, therefore, we direct attention to a paragraph in a circular recently issued by J. L. Henritzy, telegraph superintendent of the Colorado & Southern. Speaking of the introduction of the telephone in place of the Morse telegraph Mr. Henritzy gives various instructions and suggestions concerning efficient transmission, and then adds that it is of first importance to adjust the lips to the transmitter properly. With the lips one inch away the speaker diminishes the effect the same as if he were to add 63 miles to the line; two inches, 122 miles, and so on. How much joy is there in a smile 63 miles away? The literalist will say that there is no such thing as a voice with a smile; but it

is quite certain that a careless person can with his voice very easily produce the opposite of a smile at a distance of 63 miles. And often at much shorter distances!

Permanent Roadbed

THE section of concrete roadbed recently installed on the Pere Marquete near Detroit, which was described in the *Railway Age* of January 8, is being watched with great interest. The costs involved are high but the benefits to be gained, if the experiment proves successful, are large. In one respect the present winter has not been a particularly fortunate time to test the installation since the weather has been mild and there has been little chance to observe the behavior of the roadbed under severe frost conditions. The discussion on permanent roadbeds at the recent convention of the American Railway Engineering Association raised some questions that this experiment will answer, but other questions, such as that relating to the reduction of rolling resistance due to a rigid roadbed, will depend on more extensive installations or further engineering studies.

Clear Vision Coach Windows

FIRST-CLASS passenger equipment, such as Pullman cars, diners, lounge and club cars, usually has windows of plate glass, but many day coaches, although suffering keener competition for short haul passenger business, are equipped with ordinary rolled glass windows. This inferior glass creates an unfavorable impression on the passenger. The present huge consumption of plate glass in this country, reported as 150 million square feet in 1925, has enabled production methods to be installed which bring polished plate glass within the economic reach of manufacturers of the lowest priced automobiles and of even the average home builder. It seems apparent that from a competitive point of view alone the railroads can ill afford to specify in any passenger equipment window glass which is inferior to that used in the majority of automobiles, buses, and taxi-cabs. In addition to the advantage of clear vision, plate glass is less liable to breakage in application or service. It is now available in thicknesses of 3/16 in. or less and can, therefore, be used either in new window sash or for replacement in sash originally designed for thin glass. While costing somewhat more, polished plate glass represents an almost negligible proportion of the cost of a modern passenger car.

The Railroads and "The Fickle Public"

IN an informative article in the current Atlantic Monthly, Ernest Elmo Calkins, the advertising expert, discusses the lightning rapidity with which the American public has of recent years changed its habits of consumption to the great embarrassment of producers. Sales of men's shoes have dropped off one-third, resulting in grave problems for manufacturers. Changes in fashions of women's attire have been even more sudden and widespread in their effect. The decline in social letterwriting has put a crimp in the fancy social stationery business. Electric refrigeration is threatening the ice man. The new "lacquers" which can be applied by spray may be the handwriting on the wall for the painters who through their union refuse to use the air brush. Truly the producer of any commodity, however staple he may think his product to be, can well afford to be constantly on the *qui vive* lest some newcomers step in and take his bread-and-butter. Although Mr. Calkins does not say much about them, the railroads have their serious problems which have arisen from the conditions he describes. What can they do about it? Answers may differ, but one surely is the increasing use of the new competitor, the motor vehicle, by the railroads themselves. Mr. Calkins cites how the phonograph manufacturers at first were inclined to ignore the radio but, after it had seriously curtailed their sales, met its challenge by perfecting a new and greatly improved phonograph. The railroads are doing something of the same thing, i.e., meeting competition by greatly improved service, particularly for the longer hauls. The important point, however, to bear in mind is not some one method of meeting competition, but rather the adoption of a modern attitude toward the consuming public, endeavoring constantly to hold interest by prompt adoption of improvements, amply publicized. No industry today can feel safe which has not a high grade of merchandising skill guiding its policy.

Greater Utility of Track by Either Direction Operation

AS a means of securing increased capacity from existing track facilities consideration is being given to the idea of signaling one or more tracks of a multiple track road so that they may each be used as a single-track line on which trains may be operated in either direction by signal indication. The Cleveland, Cincinnati, Chicago & St. Louis has made a practice for years on double track of running passenger and fast freight trains against the normal direction of traffic to get them around slow drag freight trains without laying out the heavier trains. The Burlington uses a similar method on 124 miles of double track from Aurora, Ill., to Galesburg, and the Illinois Central has 20 miles of double track so signaled, while the Missouri Pacific, which is now constructing a second track between St. Louis and Jefferson City, is providing new color-light signals for right-hand running and using the old semaphores for left-hand running to permit operating trains in either direction on either track by signal indication. The Burlington and the Illinois Central have also signaled the middle track of three-track sections for movements in either direction and the New York Central has equipped one track of its four-track line approaching the Grand Central terminal in this manner. The Chesapeake & Ohio has gone a step further in signaling all tracks of a three-track line for train movements in either direction with a unique method of d-c. traffic direction locking which installation has proved successful, as described elsewhere in this issue. These methods of utilizing the various tracks of multiple track lines to handle the preponderance of traffic in one direction or the other during different periods of the day permits a decided increase to be secured in operating efficiency and leads to important economies because existing facilities are thus used with greater intensity with only a comparatively small expenditure for additional signaling.

Gulf, Mobile & Northern

ANOTHER so-called merger railroad was distinguished by stock market popularity during the past week and now takes a place among those roads that have of late attracted more than their ordinary share of attention in the financial columns. The common stock of the Gulf, Mobile & Northern advanced 21 points in two days' activity on the New York Stock Exchange and its closing price on March 16 was 62½. At one time it reached 68, which was about double its price the first week in January. The number of shares traded during the week totaled 114,500, which was more than 100 per cent turnover, as there are only 109,941 shares of this issue outstanding. The company's preferred stock is now selling at about 111. It pays 6 per cent dividends but there are 17½ per cent cumulated dividends in arrears. No dividends have ever been paid on the common stock and it is not likely that any will be paid in the near future. In 1926, according to the company's recently issued annual report, the net income after charges was equivalent after allowance for preferred dividends to $5.77 per share on the common. The Gulf, Mobile & Northern came out of receivership at the beginning of 1917. Since that time it has made substantial increases to its mileage, has increased its traffic about three times and its net operating income in 1925 was about 2½ times its standard return for operations during federal control. The road last year acquired trackage rights over the Nashville, Chattanooga & St. Louis between Jackson and Paducah and made a traffic agreement with the Burlington which has given the latter road an outlet to the Gulf of Mexico at Mobile and much high grade traffic to the Gulf, Mobile & Northern. The reasons assigned for the present popularity of the stock are merger possibilities. It is said, for instance, that the Illinois Central and the Burlington each want the property.

Bridge Over the Gap

IT is quite as necessary in setting up plans for selecting and training promising men for promotion to supervisory positions to look ahead and determine how they are to be utilized at the close of the training period as it is to arrange for the course of training. Obviously no guarantee or promise can be made as to exactly when these men will be promoted or the particular positions which will be open to them. A number of instances have been brought to our attention in which young men have completed special courses of training in the expectation that they would be assigned to positions of responsibility at the end of the course. The fact that such use was not made of them and that they were assigned to, or kept on, quite ordinary classes of work caused keen dissatisfaction, and several men of outstanding ability and exceptional training have been lost to railway service.

The argument is advanced that if they cannot be placed in supervisory positions, there are boundless possibilities of special studies and experimental or research work to which they can be assigned, the results from which will fully justify the expenditure involved. The difficulty, and it may be largely psychological, appears to be that there is no clear understanding as to just what the status of these young men will be when they have completed their special courses of training. Obviously the time of promotion cannot coincide, at least in many cases, with the completion of the course. Moreover other experience may be quite necessary in order fully to fit the graduates for supervisory positions. Some method must be devised to bridge over the gap. Much progress will be made if the status of the graduates can be more clearly defined in advance for the period which follows such training. This will prevent misunderstandings and heartburnings. Nothing is more discouraging to an ambitious man than to have the feeling that he is in a blind alley; he wants to know in what direction he is headed and to have reasonable assurance that he is on the right track.

Panaceas for Yard Ailments

THE possibilities for savings in yard operation are practically limitless. It is not so many years since yards were regarded primarily as places in which to store cars and the vestiges of this mistaken and wasteful practice are still to be found here and there about the country. For every three miles of main, second, third and fourth tracks, there is more than one mile of yard and industry tracks, and, with this much room to get lost in, cars have a habit of staying in yards longer than is good for them.

The chief yard problem is the classification of cars. Where the volume of traffic is sufficient, hump yards with various mechanical aids for prompt classification have been found of aid in reducing costs. That hump yards are not always panaceas for yard ills, however, is indicated by the recent action of a large western railroad which, after thorough study, took out the hump at one important terminal with the result that this yard is now being operated more efficiently and at less cost as a flat yard. This instance is cited merely to show that in yard service there is no such thing as standard methods or standard operations. Traffic conditions and physical conditions differ too radically in various yards to make a blanket remedy for yard evils simple and easy. A system that is highly efficient in one yard is quite likely to be the reverse in another. The only solution is to adapt an efficient system to the peculiar needs of the particular yard under consideration.

One of the most significant developments in the way of yard economy in recent years is the "maintracker" system of classification. The basic principle of this system is to make up trains in such a manner that they will not have to be switched in every yard they pass through, but can be operated through several yards as "maintrackers" without entering intermediate yards at all, except to change locomotives. This idea is being carried out to a limited extent on many railroads, but it is on the Baltimore & Ohio and the Chicago, Rock Island & Pacific that the system has received its highest development.

A description of the plan as it has been worked out on the Baltimore & Ohio will be found in the *Railway Age* of August 6, 1921, page 254, and August 19, 1922, page 329, while the Rock Island plan was described by its originator in the issue of February 19, 1926, page 515.

Operating conditions on the Baltimore & Ohio and the Rock Island are radically different. It was not possible to install the Baltimore & Ohio system bodily on the Rock Island and make it work. In fact, it was necessary to devise what is, to all intents and purposes, a different system, based on the same idea. However, when two roads as unlike as the Rock Island and the

Baltimore & Ohio are able to make remarkable savings by the use of the same principle of yard operation, it may be that an approach to the blanket remedy for yard ills has at last been found. In any event, a comparison of the methods used, with an eye to their adaptation to meet the conditions on their own lines, should prove to be highly interesting to the operating executives.

What the "Surcharge" Statistics Exhibit

COMPLETE statistics of the Interstate Commerce Commission regarding railway passenger earnings in 1926, which recently have become available, again strikingly illustrate, as did those for 1925, the strong tendency of the public to increase its patronage of sleeping and parlor car service, and reduce its patronage of day coach service. Attempts continued to be made throughout the last session of Congress to get a law passed to abolish the "surcharge" on sleeping and parlor car tickets, and yet it is the increase in railway earnings from the surcharge which makes clear the continuing large increase in travel in sleeping and parlor cars and renders it possible to show with approximate accuracy the decline in day coach travel. The surcharge makes it necessary for the traveler in a sleeping car to pay the railway about ten per cent more fare than the traveler in a day coach, and on this basis it is possible to estimate pretty accurately the changes in travel in different kinds of cars.

The total revenue received by the railways from the surcharge in 1926 was $41,492,339. This was the largest amount ever collected in a year, and shows an increase of about 4 per cent over 1925 in travel in sleeping and parlor cars. The total increase in railway earnings from sleeping and parlor car business was about $17,000,000, while the decline in earnings from day coach business was about $30,000,000. There was an increase in earnings from commutation service, which is rendered entirely in areas of dense population. This shows that practically all the traffic lost was taken from local passenger trains, which are especially subject to competition from private automobiles and from motor buses.

In 1921, when general business was severely depressed, the amount of passenger business handled by the railways was much less than in 1920, but, while sleeping and parlor car travel has increased over 27 per cent since 1921, travel in day coaches has declined more than 26 per cent. In 1921 the railways handled only 31 per cent, or less than one-third, of their passenger business in sleeping and parlor cars, and 69 per cent in day coaches. In 1926 they handled almost 44 per cent of it in sleeping and parlor cars, and only about 56 per cent in day coaches. The day coach business, exclusive of commutation travel, was only about 49 per cent of the total, showing that outside of areas of congested population motor competition has now reduced day coach business until it exceeds travel in sleeping and parlor cars by only a narrow margin, whereas five years ago it was almost twice as large.

In view of the continuing large increase of travel in sleeping and parlor cars, in which the surcharge has to be paid, and the continuing large decline of travel in day coaches, in which it does not have to be paid, the argument that the surcharge ought to be abolished because it keeps people who cannot afford to pay it from riding in sleeping cars becomes rather farcical.

Progress in Concrete Practices

THE action taken by the American Railway Engineering Association in adopting specifications embodying the application of a water-cement ratio as the criterion for proportioning concrete marks a definite stage of progress in the improvement of practices in concrete construction. It is a further evidence that the railroads are retaining a leadership which they have exercised throughout the history of the modern use of concrete, for the recent action by the Association is in large measure an official endorsement of what has become an accepted practice on the part of a considerable number of the railroads.

This, however, is not the only phase of recent developments in concrete construction in which the railroads have shown the way. They have offered a particularly attractive field for the application of methods and materials designed to obtain a high early strength in concrete because of the numerous occasions where construction procedure may be simplified if it is possible to put a structure in service within a short time after placing the concrete. This has led to the use of rapidly-curing cements in bridge floor slabs, pedestals for turntable centers, and the like. But, as has been shown by the Portland Cement Association, it is not always necessary to use special cements to gain this end. Portland cement conforming to the standard specifications of the American Society for Testing Materials, if used with a minimum amount of mixing water, i.e., a low water-cement ratio, will produce concrete having a compressive strength of as much as 800 lb. per sq. in. in 24 hours and over 2,000 lb. within 3 days. Calcium chloride, if used as an admixture in proper proportions, will also add to the early strength.

Thus, the engineer is afforded a choice of several means of obtaining the same end, although the ultimate possibilities of all are not the same. However, except under the burden of extreme requirements which probably will call for the use of special cements, the choice will usually be predicated upon considerations of economy. In other words, the question becomes one of the relative costs of a mixture using a special cement or one calling for a richer mix of standard cement with or without special admixtures. But regardless of which of these methods or materials proves most adaptable, they open a new field in concrete construction practices which should prove particularly attractive in railway work.

The A. R. E. A. Convention

THE American Railway Engineering Association is a unique organization in a number of ways. It takes its work very seriously, allowing no place in its program for relaxation. All of its 28 annual conventions have been held in the winter and in the same city, Chicago. It does its work entirely through committees, now 26 in number, on which 695 members served last year. The convention is given over entirely to the presentation and consideration of the reports of these committees, to which 155 subjects were assigned for study last year. Its conclusions are incorporated in a Manual of Recommended Practice which has few counterparts in industrial literature. Its membership is individual rather than by roads and is composed primarily of officers of the engineering department, although 46 presidents are found on its rolls and 3 past-presidents of the association are now the chief executives of important railways.

The annual convention last week was characteristic of the organization. It was the most largely attended in the history of the association with a registration of 925 members and 346 guests. A present membership of 2,511 was reported, a net gain of 189 for the year. The reports presented covered 1,194 printed pages and three full days were given to their consideration. Even with the closest attention to work, however, the pressure was such that discussion was limited; only 39 of the more than 900 members present participated from the floor. This situation, which has become more acute each year, is causing much complaint and the Board of Direction was instructed to give consideration to the development of some plan for its correction.

Among the newer departures in the association's work during the last year was the reorganization of the work of the old committee on Signs, Fences and Crossings into a new committee on Grade Crossing Design, Protection and Elimination, which gives promise of much valuable work in the future. Its first report embraced detailed data on methods now in vogue for the apportionment of costs of grade crossing improvements between the railways, other utilities and the public, and on the relative merits of manual or power-operated protection versus watchmen at grade crossings. Another development of promise during the year was the change in policy adopted by the committee on Standardization which will now devote its efforts primarily to promoting the use of the association's standards.

The diversity of the problems considered by this association and the close relation of its work to that of other departments of railway service are shown by reference to only a few of the subjects considered last year. The exhaustive study of stresses in track which has been in progress for 15 years has already led to the redistribution of weights in locomotive design. The study of pitting and corrosion of boiler waters has for its object the lengthening of the service life of locomotive flues and the reduction in the cost of boiler maintenance. Safety of travel is the objective prompting the study of defects in rail steel, principal among which is the transverse fissure of which nearly 4,000 are now being reported annually. Improvements in train operation will be the logical result of the studies of the spacing of water stations, of ways of increasing the capacity of a line and of the relative merits of different ways of increasing tonnage. Regulation should be aided by the work of the Tie Committee in submitting to the Interstate Commerce Commission a revision of its form for tie statistics which will permit comparisons of tie renewals between different roads.

Among the broader problems of railway operation considered was that of the branch line whose operation has been made unprofitable by the motor bus and the motor truck. Likewise, the report on stabilization of employment in the maintenance-of-way department promises results extending beyond the limits of this department and in fact beyond the railway industry itself. Among the topics of more direct interest to the engineering department and yet of almost equal concern to those responsible for the safe and smooth movement of trains were the investigation of practices relative to curve superelevation and on the causes and prevention of rail battering. Still more technical, but none the less important and valuable, were the reports on recent developments in the art of making concrete and on the value of treated timber in wooden bridges; while looking somewhat to the future, was the report of the possibilities of more permanent track construction as exemplified by the section of concrete roadbed installed on the Pere Marquette.

Taken as a whole, the convention was one of the most constructive in the more than a quarter century's history of this organization and its work measures well in comparision with that of other associations within as well as outside of the railway industry.

Motor Transport Knowledge

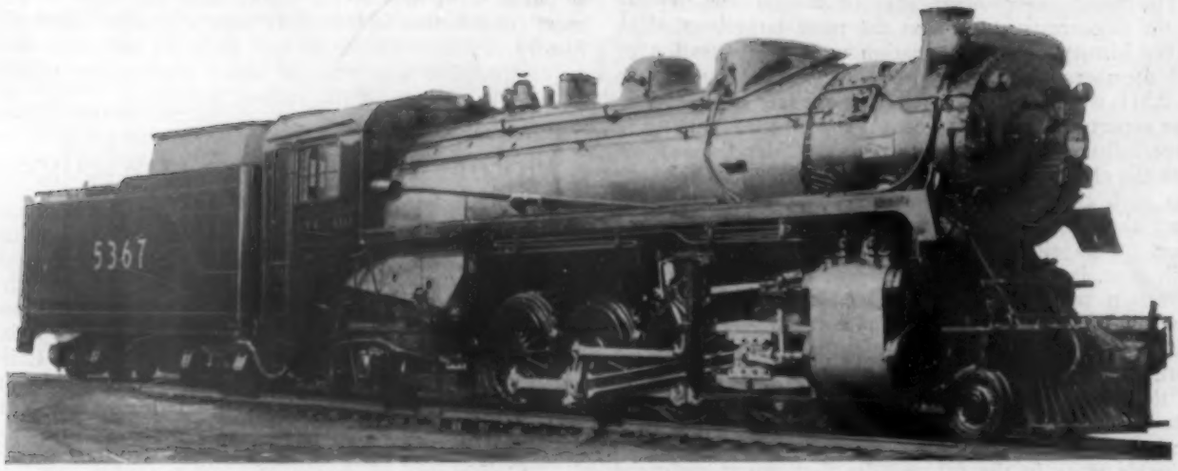
AT least three organizations of railway officers are now studying the problem of motor transport, its effect on railway operation and the possibilities inherent in the adoption of this form of transportation by the railways. These organizations are the American Association of Railroad Superintendents, which has a special committee assigned to this subject; the American Railway Engineering Association, whose committee on Economics of Railway Operation includes a subcommittee assigned to the study of the effect of motor transportation on branch lines; and the Railroad Motor Transport Conference, which was organized less than a year ago for the express purpose of dealing with the question. Other associations of railway officers have given attention to special phases of the problem of particular importance to their members. It is obvious, therefore, that the number of railway officers studying motor transportation through the associations of which they are members, entirely aside from the thought they give it as a competitor or an ally of their individual companies, is large.

The question has been raised as to whether there is unnecessary duplication of effort. Should steps be taken to reduce the number of officers who are concerned through their associations with this problem? Should other associations abandon their study, leaving the field to the Railroad Motor Transport Conference?

Granting that the number of railroad officers studying the question of motor transport is large and granting also that there may be a certain amount of duplication of effort, it seems highly desirable that all these studies be continued, at least for the present. Motor transportation is in its infancy. Few will claim that it is a passing fancy soon to eliminate itself. Most will agree that it holds great possibilities, particularly if it is taken in hand and developed by the railways. If motor transportation is to play a larger and larger part in the affairs of the railways, it is desirable that as many railway officers and officers of as many departments as possible be familiar with what is being done in this field so that they will be equipped to co-operate with each other in working out its future.

If the study of the question of motor transportation is left exclusively to the Railroad Motor Transport Conference, the number and classes of officers who will be able to benefit from it will be limited. Knowledge of motor transportation will be much more widely disseminated with the other groups of officers studying the problem in their various associations. Such practice is, therefore, highly desirable because the success of the individual railways in dealing with this new form of transportation will depend, not upon the knowledge of one or two of their officers, but rather on the familiarity with this subject of virtually all of their officers.

This does not mean the subordination of the Railroad Motor Transport Conference. The conference will still be the leader, as it is intended to be. It can go farther into the study of motor transportation than any other group. But a knowledge of this new factor in transportation gained from their own studies will make other officers in other departments more receptive to the findings of the Conference and will enable them to carry out the plans of their managements more intelligently.



One of the Mikado Type Locomotives Built for the Canadian Pacific by the Canadian Locomotive Company

Canadian Pacific's New Locomotives Give Improved Performance

Refinements in design of Pacific and Mikado types show added efficiency in six months' operation

PACIFIC and Mikado type locomotives of 42,600 lb. and 56,300 lb. tractive force, respectively, have been the standard heavy passenger and general freight service locomotives on the Canadian Pacific for the past eight years. These locomotives were designed in 1919 by the mechanical staff of the Canadian Pacific as the largest locomotives of their respective types that could be generally used for main line traffic. There was nothing unusual about these locomotives; they were well proportioned power operating at 200 lb. boiler pressure. When the question of additional power was being considered in 1926, it was decided that in general these two classes of locomotives should be perpetuated with the exception that such improvements in capacity and efficiency would be made as was possible without increasing the weight beyond a rather narrow range. What was accomplished in this respect is illustrated in the following table which gives a comparison of the principal weights, dimensions and proportions of the earlier locomotives and the new designs:

Comparison of Principal Proportions of the Former Pacific and Mikado Designs with Those of the New Locomotives

	Pacifics		Mikados	
	New	Former	New	Former
Tractive force, lb.	45,000	42,600	57,100	56,300
Cylinder horsepower (Cole)	2,379	2,252	2,379	2,342
Cylinders, diameter and stroke	23x30	25x30	23x32	25½x32
Diameter of drivers, in.	75	75	63	63
Weight on drivers, lb.	184,300	179,300	244,600	240,100
Total weight of engine, lb.	306,500	300,500	335,200	321,800
Boiler pressure, lb. per sq. in.	250	200	250	200
Grate area, sq. ft.	65	65	70.3	70.2
Total evap. heating surface, sq. ft.	3,272	3,530	3,436	3,562
Total superheating surface, sq. ft.	864	803	970	973
Comb. evap. and superheating, sq. ft.	4,136	4,333	4,406	4,535
Weight on drivers ÷ tractive force	4.08	4.22	4.2	4.27
Total weight engine ÷ total heating surface	74	69.3	76	71.2
Tractive force ÷ comb. heat surface	10.9	9.78	12.95	12.38
Firebox heat. surf., per cent of evap. heat. surface	8.9	8.44	9.0	8.59

Modifications eventually decided on included an increase in boiler pressure of 25 per cent or up to 250 lb. pressure per sq. in., the use of feedwater heaters, the use of front end throttles and the operation of auxiliaries by superheated steam. The application of the Elesco closed type of feedwater heater with a C-F1 class duplex pump, accounted for the increase in weight of 6,000 lb. To increase the boiler pressure 25 per cent and at the same time to keep within a total locomotive weight increase of two per cent would, on the face of it, appear an impossibility. But in doing this, the Canadian Pacific put into effect a step in locomotive construction that it has been investigating and considering for a considerable length of time. This was the use of nickel steel boiler plate of 70,000 lb. per sq. in., minimum tensile strength, which permitted on the two designs of locomotives under discussion an increase in boiler pressure up to 250 lb. per sq. in. without any change in the thickness of the barrel course plates. Altogether, 44 locomotives were constructed in 1926, 24 Pacific type locomotives being built by the Montreal Locomotive Works, Montreal, Que., and 20 Mikado type constructed by the Canadian Locomotive Company, Kingston, Ont. All 44 were delivered during August, September and October, 1926, and they have fully justified the expectations of improved performance and efficiency due to the higher boiler pressure and other improvements in design.

Boiler of Nickel Steel Permits Increase in Pressure

The boiler has been changed very little over the base design for 200 lb. pressure. It is of the radial stay type and beyond the thickening of the wrapper sheet and firebox side sheets and a careful investigation and checking of all details of construction, there are practically no changes made other than the substitution of nickel steel boiler plate for carbon steel in the first, second and third course sheets and welt sheets and the

use of steel for longitudinal braces of the boiler.

The nickel steel boiler plate is open hearth basic steel made and rolled by the Lukens Steel Company with the joint inspection and co-operation of the American Locomotive Company, the International Nickel Company and the Canadian Pacific. It was anticipated that the plates would have a somewhat pitted surface typical of nickel steel but the surface conditions were quite equal to carbon steel boiler plate. The use of nickel steel effects a saving of 27 per cent in the weight of the barrel course sheets, or permits the use of higher pressure without a corresponding weight increase.

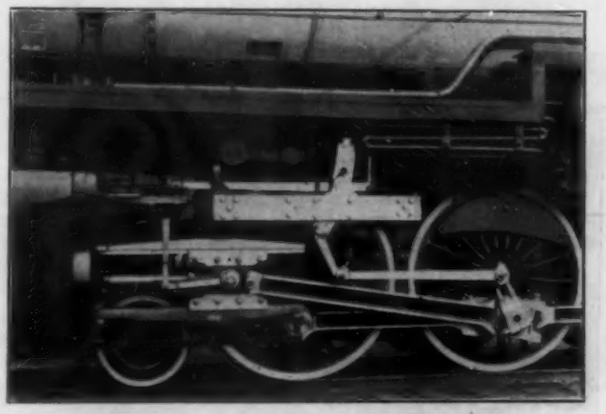
This being the first alloy steel produced by the Lukens Steel Company, there was some preliminary work and investigation required before the material was finally produced on a commercial basis, but once started, very uniform material was produced. To illustrate, an analysis was made of the physical properties of 465 determinations of nickel steel boiler plate and an equal number for carbon steel boiler plate on a previous order for locomotives. The average results obtained on the nickel steel were as follows: Tensile strength, 76,700 lb.; yield point, 46,800 lb.; elongation, 26 per cent, and reduction of area, 53 per cent. The average tensile strength and yield point for carbon steel boiler plate ran 59,200 lb. and 36,200 lb., respectively, so that the gain in strength based on average results is 29 per cent on both the ultimate strength and yield point basis.

The maximum variation in the various physical properties above and below the average were found to be almost identical for the nickel steel and for an equal number of carbon steel determinations.

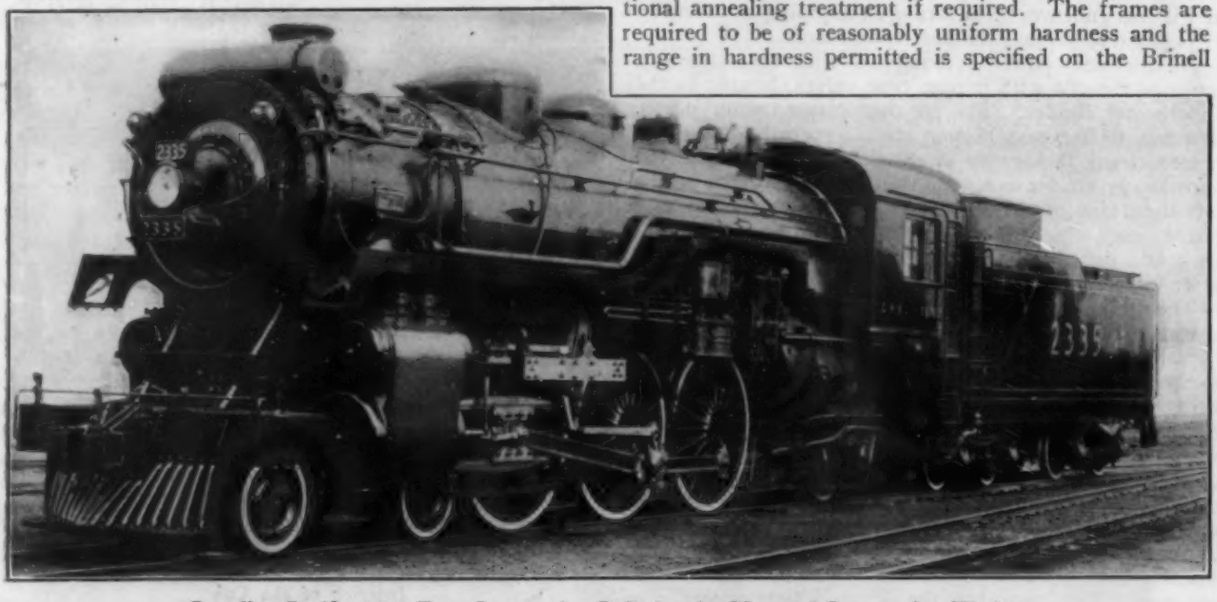
The nickel material is remarkably tough and ductile and generally speaking, in the transverse bend tests, the heaviest plate can be bent flat on itself without fracture. Specification requirements call for bending of the plate around a pin, the diameter of which is equal to a certain percentage of the plate thickness, this being worked on a sliding scale based on the usual practice for carbon steel. As nickel steel stood this test readily, the tests were usually carried further until the plate would bend flat on itself and the illustration shows a typical specimen which illustrates the ductility of the material and its ability to withstand the transverse bend tests. From the shop viewpoint, there is little if any difference between nickel and carbon steel from the standpoint of punching, drilling or reaming.

The Frames

The frames of the Mikado type locomotives are of carbon vanadium steel and the frames of the Pacific type locomotives are carbo-vanadium steel on half the order and nickel steel on the balance of the locomotives. The Canadian Pacific has been using vanadium steel frames for 15 years and for the past four years has been purchasing alloy frames to very severe specification requirements. Eight test coupons are cast on selected locations on each frame and six coupons are pulled for each individual frame, the remaining two being left on for additional annealing treatment if required. The frames are required to be of reasonably uniform hardness and the range in hardness permitted is specified on the Brinell system. Exceptionally good results have been obtained for a number of years from the use of alloy steels for locomotive frames.



Motion Work of the Pacific Type Locomotive



Canadian Pacific 4-6-2 Type Locomotive Built by the Montreal Locomotive Works

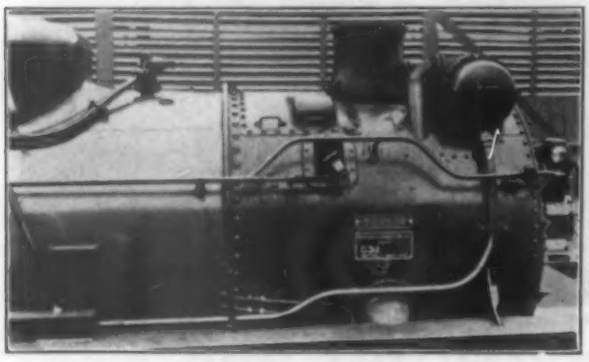
Alloy Steel in the Running Gear

There was a particular incentive in increasing the efficiency and capacity of the Pacific type locomotives as this class of power handles very heavy trains on severe schedules at high speeds. More than the usual care was, therefore, paid to the design of the reciprocating parts,

not only to reduce the weight, but to use the highest grade of steel obtainable. Alloy steel has been used for main and side rods on both freight and passenger power for a considerable number of years past and this practice was continued with both classes of power, the Pacific type locomotives being equipped with carbon-vanadium rods and the freight power with nickel-steel rods. This was the Candian Pacific's first experience with nickel steel rods and good results were obtained.

Special Equipment

The Elesco Company's type H-5 feedwater heater has been adopted as standard on the new series of locomotives as the result of a good many years' testing of various types of closed heaters. Considerable attention was paid to the mounting of the feedwater heater itself and it was endeavored to arrange the piping as carefully as possible to present the best appearance.



Arrangement of the Feed Water Heater, and the Outside Throttle Connection

All the new power is equipped with the American multiple throttle with poppet type valves, located in the superheater header. The air compressor, water pump, dynamo, whistle and blower are all operated by superheated steam, the supply of steam being taken from the superheater header to a main control valve located on the left hand side of the smokebox just above the running board, from which the superheated steam line is brought back and distribution of the steam made from immediately in front of the cab to the various auxiliaries.

The use of an outside connected throttle has permitted a considerable revision in the cab arrangement as will be seen from the back head view. The water glass is located in the direct center of the boiler, the glass itself being protected by a water glass guard of the railroad company's design which permits ready access to the water gage mountings for changing of water gage glasses. All auxiliary valves have extension handles to one central point in the cab to permit maximum ease of operation. The pressure gages are conveniently located, as shown in the cab illustration. Five-feed hydrostatic lubricators are used on the Pacific type locomotives and seven-feed lubricators on the Mikado type power, the former locomotives being hand fired and the latter stoker fired by a Duplex type D-1 stoker.

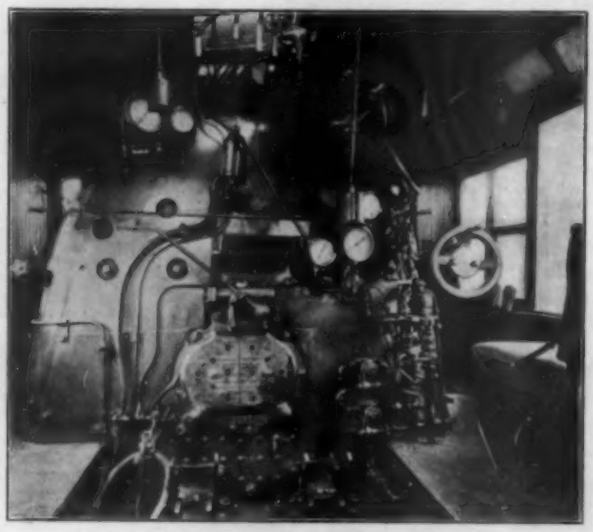
The whistle is of a new design and is of rugged and simple construction. The electric classification lamps are of the railroad company's design and are of cast aluminium alloy. The change in color is provided by an inside cylindrical rotating member which carries the glass and is so constructed as to prevent light leakage, which is apt to cause reflections and improper color registration at some angles of vision.

The design of driving and idler boxes, in fact, the majority of the details on the two locomotives are interchangeable. The Pacific type locomotives have Commonwealth Steel Company's one-piece cast steel four-wheel engine trucks, and both classes have cast steel rear frame extensions and cast steel tender underframes. Franklin butterfly type firedoors are used on the Pacific locomotives and the Franklin clam shell type on the stoker equipped Mikado type locomotives. The reverse gears are of the screw type, of the railroad company design.

The weights, dimensions and proportions of the two classes of locomotives are given in the table.

Table of Dimensions, Weights and Proportions of Canadian Pacific Class P-2-E and G-3-D Freight and Passenger Locomotives

Type of locomotive	4-6-2	4-8-2
Railroad classification	G-3-D	P-2-E
Builders	Montreal Locomotive Works	Canadian Locomotive Company
Service	Passenger	Freight
Cylinders, diameter and stroke	23 in. by 30 in.	23 in. by 32 in.
Valve gear, type	Walschaert	Walschaert
Valves, piston type, size	14 in.	14 in.
Maximum travel	7 in.	7 in.
Outside lap	1 1/16 in.	1 1/16 in.
Exhaust clearance	1/4 in.	3/8
Lead in full gear	1/4 in.	7/32
Weights in working order:		
On drivers	184,300 lb.	244,600 lb.
On front truck	62,000 lb.	30,600 lb.
On trailing truck	60,200 lb.	60,000 lb.
Total engine	306,500 lb.	335,200 lb.
Total tender	192,260 lb.	229,500 lb.
Total engine and tender	498,760 lb.	564,700 lb.
Wheel bases:		
Driving	13 ft. 2 in.	16 ft. 6 in.
Rigid	13 ft. 2 in.	16 ft. 6 in.
Total engine	35 ft. 0 in.	35 ft. 8 in.
Total engine and tender	67 ft. 10 in.	72 ft. 1 1/16 in.
Wheels, diameter outside tires:		
Driving	75 in.	63 in.
Front truck	33 in.	31 in.
Trailing truck	45 in.	45 in.
Journals, diameter and length:		
Driving, main	12 in. by 14 in.	12 in. by 14 in.
Driving, others	10 1/2 in. by 14 in.	10 1/2 in. by 14 in.
Front truck	6 1/2 in. by 13 in.	6 1/2 in. by 13 in.
Trailing truck	9 in. by 14 in.	9 in. by 14 in.



Interior of the Cab

Boiler:		
Type	Straight top—extended wagon bottom	Sraight top-extended wagon bottom
Steam pressure	250 lb.	250 lb.
Fuel	Bituminous	Bituminous
Diameter, third ring, outside	88 in.	90 in.
Firebox, length and width	111 7/8 in. by 84 1/4 in.	120 7/8 in. by 84 1/4 in.
Arch tubes, number and diameter	4—3 1/2 in.	4—3 1/2 in.
Combustion chamber length	26 in.	26 in.
Tubes, number and diameter	28—2 in. and 160—2 1/4 in.	32—2 in. and 158 2 1/4 in.
Flues, number and diameter	40—5 1/4 in.	45—5 1/4 in.
Length over tube sheets	18 ft.	18 ft.
Grate area	65 sq. ft.	70.3 sq. ft.

Heating surfaces:		
Firebox and comb. chamber	258 sq. ft.	274 sq. ft.
Arch tubes	33 sq. ft.	36 sq. ft.
Tubes	1,950 sq. ft.	1,966 sq. ft.
Flues	1,031 sq. ft.	1,160 sq. ft.
Total evaporative	3,272 sq. ft.	3,436 sq. ft.
Superheating	864 sq. ft.	970 sq. ft.
Comb. evaporative and superheating.	4,136 sq. ft.	4,406 sq. ft.
Tender:		
Style	Rect. water bottom	Rect. water bottom
Water capacity	8,000 Imp. gal. (9,600 U. S. gal.)	10,000 Imp. gal. (12,000 U. S. gal.)
Fuel capacity	12 ton	16 ton
Wheels, diameter	36 in.	36 in.
Journals, diameter and length	6 in. by 11 in.	6½ in. by 12 in.
General data, estimated:		
Rated tractive force, 85 per cent	45,000 lb.	57,100 lb.
Cylinder horsepower (Cole)	2,379	2,379
Speed at 1,000 ft. piston speed (estimated)	44.6 m.p.h.	35.1 m.p.h.
Weight proportions:		
Weight on drivers ÷ total weight engine, per cent	60	73
Weight on drivers ÷ tractive force.	4.08	4.2
Total weight engine ÷ cylinder hp.	129	141
Total weight engine ÷ total heating surface	74	76
Boiler proportions:		
Tractive force ÷ comb. heat. surface	10.9	12.95
Tractive force × dia. drivers ÷ comb. heat. surface	816.0	816.5
Cylinder hp. ÷ grate area	36.55	33.8
Firebox heating surface, per cent of evap. heat. surface	8.9	9
Comb. heat. surface ÷ grate area	63.5	62.8

Report on the Collision Occurring at Larrabee, Mo.

W. P. BORLAND, director of the Bureau of Safety, has made his report to the Interstate Commerce Commission on a collision which occurred on the Chicago & Alton two miles west of Larrabee, Mo., on January 23, about 5:10 a. m., when a baggageman was killed and 13 passengers and two employees were injured. The crew of a freight train, waiting on a side track to meet two passenger trains, fell asleep, and afterward started out in the face of the second passenger train.

Westbound passenger train No. 9, moving at 30 or 40 miles an hour, collided with eastbound freight train second No. 84. The wooden baggage car of No. 9 was wrecked and much other damage was done.

The report summarizes the evidence of the seven men involved. The line of road is straight, and Engineman Eikost, of No. 9, observed the headlight of the freight several miles away but thought it was standing at Clark (six miles west of Larrabee). He did not realize that it was moving until it came over the crest of a hill.

Fireman Womack of No. 9 said that he was looking forward continuously most of the time after leaving Larrabee but did not see the opposing headlight until it came over the crest of the hill.

Engineman Taylor, of the freight, stated that as he entered the passing track at Clark, to wait for the passenger trains, he received a clearance card authorizing him to proceed (under the manual block system) after the arrival of trains 25 and 9, provided his orders and time table rights permitted. It was about 50 minutes before No. 25 arrived and in the meantime Taylor fell asleep. On the passage of No. 25, he "was under the impression, that both trains had passed, although he had noticed only one; and immediately after the passage of No. 25, some one said 'Let's go'; whereupon, the front end brakeman opened the switch and the train was started." On seeing the headlight of No. 9, Taylor continued to watch it, *for about fifteen minutes*, being under the impression that the train was standing at Larrabee. He did not realize that it was moving until it was very near to him.

Fireman Henderson, of the freight, read the clearance card and then fell asleep. His testimony about the opposing headlight is not very clear, but it appears that he continued shoveling coal when within a half mile of the point of collision.

Brakeman Anson, of the freight, also saw the clearance card at Clark but went to sleep in the cab of the locomotive. On the passage of No. 25, he awoke and then, without conferring with anyone, proceeded to open the switch. After the train had cleared the siding, he boarded the caboose and was then asked by the conductor whether No. 9 had gone; and he replied that he had been asleep but supposed that it had (judging from what he had heard on the locomotive). He did not know that the engineman and fireman had also been asleep.

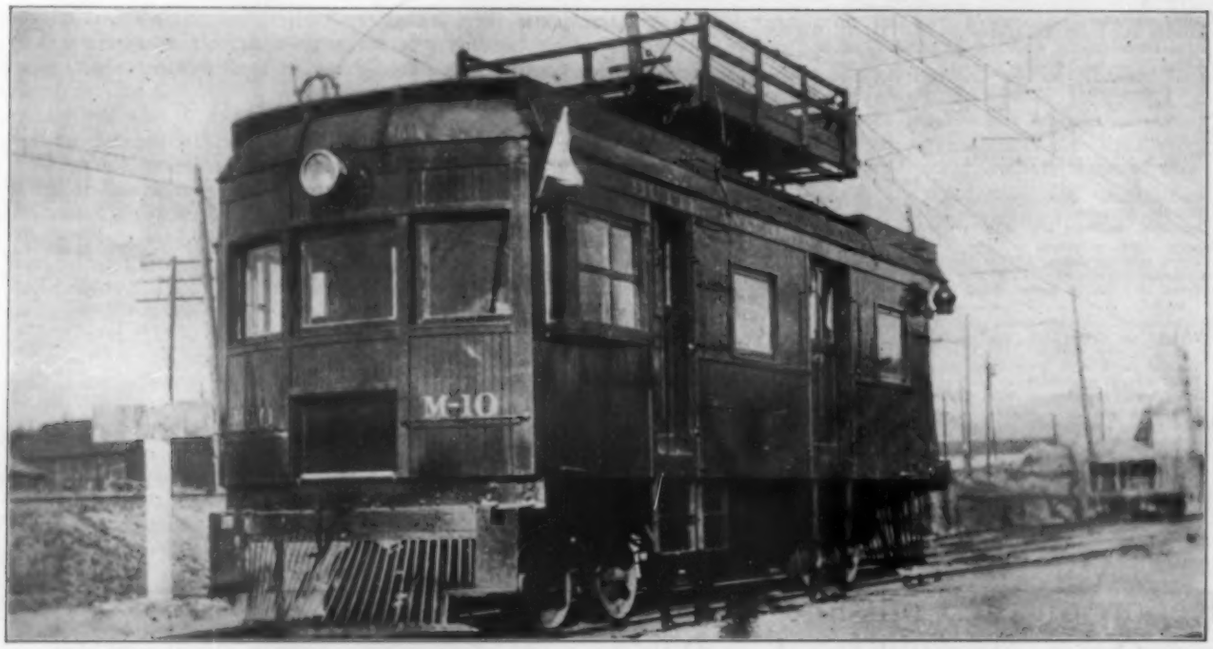
Conductor Markwell of the freight went to sleep in the caboose. He awoke about 4:45, went outside and saw the headlight of No. 25 approaching. Markwell inquired of Anson if the engineman and fireman had been asleep; Anson replied that the engineman had slept but the fireman had remained awake. Conductor Markwell could easily have telephoned to the nearest station to inform himself about the passenger train; but because of the emphatic statement of Anson, that No. 9 had passed, he decided not to do so.

Flagman Davenport, of the freight, said that when approaching Clark he felt sleepy and lay down in the caboose, in which position he remained until the collision occurred, although he was awake and heard the passing of No. 25. He knew that his train started out of the siding and he heard the conductor and Anson talking with each other.

The inspector, in his conclusion, is unable to decide who, if any one, said "Let's go" but, of course, finds no excuse for moving the train out under such uncertainty. The mistake of each engineman in not properly locating the opposing headlight is referred to as a situation which has arisen on several previous occasions. The last case was near Sacred Heart, Minnesota, on November 15, 1925, where the inspector accepted the conclusion that the determination of the location of opposing trains by their headlights is impossible under many conditions. At Sacred Heart, the headlights had been observed four miles away, and were not suspected of being dangerously near until within a distance of less than one mile. Where the grade of track is undulating, conditions may be very varied.

All of these employees who slept at Clark were experienced, and none had been on duty excessive hours; but several members of the freight crew had slept only about 2½ hours, though off duty over eight hours. In the case of some of the members of the crew, "it appeared that the reason for their failure to obtain adequate rest was the fact that they had not anticipated being called back on duty as soon as actually was the case."

Recent dedication of Santa Fe passenger station at Riverside, California



Tower Car Ready for Road; Weight 29,000 lb.

Maintaining an Overhead Contact System

Butte, Anaconda & Pacific has developed simplified methods based on thirteen years' experience

By F. W. Bellinger
Electrical Superintendent, Butte, Anaconda & Pacific

THE Butte, Anaconda & Pacific electrification covers practically all of the tracks operated and consists of 123 miles of electrified trackage. The mileage is made up of 26 miles of single-track main line, 11 miles of single-track in branch lines, which serve the mines and smelter, and 86 miles of trackage which is divided into yards, sidings, loading and unloading tracks.

Types of Catenary Now in Service

Single catenary construction is employed. Span wires in some locations and brackets in others support a ½-in. steel messenger wire from which the trolley wire is suspended by hangers located at intervals. This system of construction derives its name from the curve formed by a flexible cable suspended between two supports, and in its simple form consists of a steel messenger cable supported on insulators thus forming a catenary curve. In flexible construction, the hangers which suspend the trolley wire from the messenger are gripped to the contact wire and loosely looped over the messenger to permit a free movement of the trolley vertically, the object being to provide a straight wire so that a pantograph can be used at high speed with but little, if any, hammer-blow effect at the points of suspension.

When span-wire construction is used a pole is located on each side of the track and the span wire stretched between them. These span wires are ⅜-in. galvanized, steel-stranded cables with insulators cut in on both sides between messenger cable and the pole.

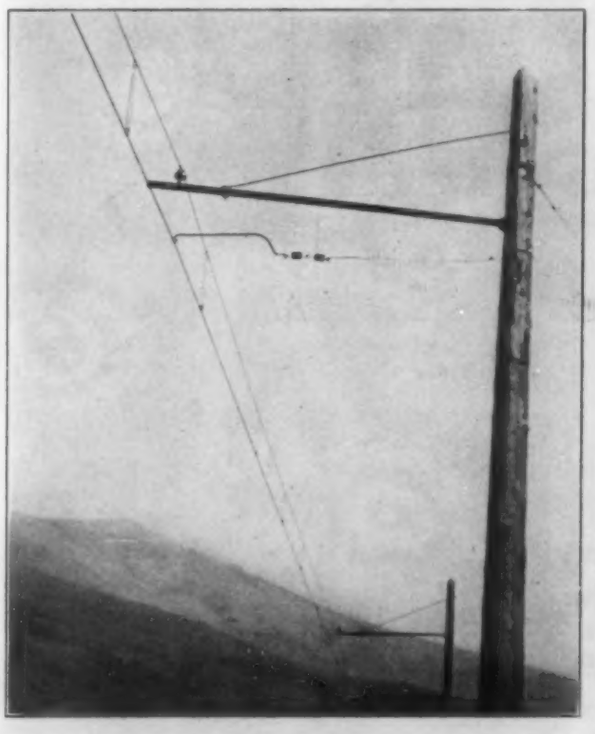
Bracket construction has the advantage of using only one pole and is, therefore, cheaper to install. The wire is supported from an insulator attached to a tee-bar arm which in turn is supported by a tension rod and pole castings. This form of construction works out very nicely for single tangent or curved track provided there are no heavy feeders to be transferred back and forth, as is the case when the curve is not all in one direction.

In both forms of construction trolley alignment is accomplished on curves by attaching pull-offs which are taken to a back-bone or wire that is stretched between two or more poles, passing back of the intermediate poles. In span construction where four or more tracks are spanned, on curves of 5 deg. or more, pull-off poles are set mid-way between the span poles. This construction requires many extra poles but is necessary to hold the suspension properly on such curves.

The construction at curves requires considerable study, as there are a number of points which must not

be overlooked. The trolley wire is located with respect to the degree of curvature and curve elevation of the track, and must be corrected for the side swing of the pantograph, the magnitude of which depends upon the height of the trolley wire and other factors. The transition at the end of the curve introduces another correction that requires careful treatment.

In a catenary system everything depends upon the messenger, which must never fail. For this reason



Catenary Pole Bracket with Flexible Pull-over

high strength steel strand is used. For important anchorages, and where the loading is high, high strength or extra high strength Siemens-Martin steel is used. For light pull-offs and steady strains ¼-in steel strand is used.

The Butte, Anaconda & Pacific installation being the pioneer 2400-volt direct-current catenary system installed in the United States, was carefully designed. However, since its installation many important changes have taken place regarding catenary contact systems.

Current Is Collected by Roller Type Pantograph

After adopting 2400-volts it was found that a maximum of 800-amp. would be required to operate two 80-ton locomotive units coupled together. While this was known to be well within the capacity of a single 4/0 trolley wire, fed at frequent intervals from both directions, the successful collection of such a heavy current from a single pantograph was a more serious problem.

Sliding pantographs of various kinds had been developed and made to operate fairly successfully for the collection of currents up to 200 amp. under similar operating conditions, but none had given any hopeful indications of being able to collect heavier currents and still have a reasonably satisfactory life.

Rollers of various kinds had been tried as substitutes for the slider, and at that time one of these, made of steel tubing, had been found to give very satisfactory results. On the whole, this type seemed to be the most promising prospect, so it was chosen for the current collecting device on the locomotive. No doubt the choice was materially influenced by the fact that it appeared reasonably sound judgment to assume that the wear would be less with a roller collector.

A Shelby steel tube 5 inches in diameter and 24 inches long, one-quarter inch thick was used. The ends were counterbored a short distance to accommodate a removable aluminum bearing housing which was fitted with roller bearings. Bronze lateral washers were placed over the end of the ⅞-in. shaft and the assemble securely clamped in place. The complete roller weighed approximately 42 lb. as against about five pounds for the corresponding contact elements usually adopted for the sliding collector. This heavy contact device could not be expected to respond so readily or so gently to hard or uneven spots in the trolley wire as do the lighter sliders. These difficulties were foreseen from the beginning and, as it was realized that the weight of the roller could not be materially reduced, it was decided to adapt a standard pantograph frame, and modify the trolley line construction with a view to removing the most serious objection to the roller by avoiding the hard spots in the line, which seemed to be its greatest enemy.

Eliminating Hard Spots

After several years' operation it was evident that not enough attention had been given to hard spots in the line. In considering what might be done by way of further improving the design of the contact system it was found that a great many rigid hangers could be replaced by light-loop hangers and that practically all pull-offs and special hardware could be substantially reduced in weight as shown in Table 1.

In line with reducing the weight of the component parts of the suspension, it was deemed essential that the pantograph be mounted one foot higher to improve its action and decrease its thrust against the wire.

Following these changes, annual inspection has confirmed the fact that the pounding at hangers unquestionably determines the life of the contact wire and that the pounding is reduced by making lighter the parts which cause hard spots. The hangers, which

Table I

	Original wt. lb.	Present wt. lb.	Per cent reduction in wt.
Single-flexible pull-offs	8.50	3.75	56
Effective wt. on wire	5.12	2.12	58
Double flexible pull-offs	18.00	3.75	78
Effective wt. on wire	18.00	2.12	84
Rigid pull-off hangers	4.50	3.75	17
Effective wt. on wire	4.50	2.12	52
Loop hangers	1.25	.87	30
Effective wt. on wire	1.25	.87	30
Sustainers	13.50	6.25	59
Effective wt. on wire	13.50	6.25	59

weighed less than any other attachment (from 14 ounces to a little more than a pound) were all too heavy when considered from the view-point of flexibility. In considering means for getting the longest life possible from the contact wire, it may be further necessary to move each hanger because of this hammering effect.

A Wide Pantograph Contact Is Desirable

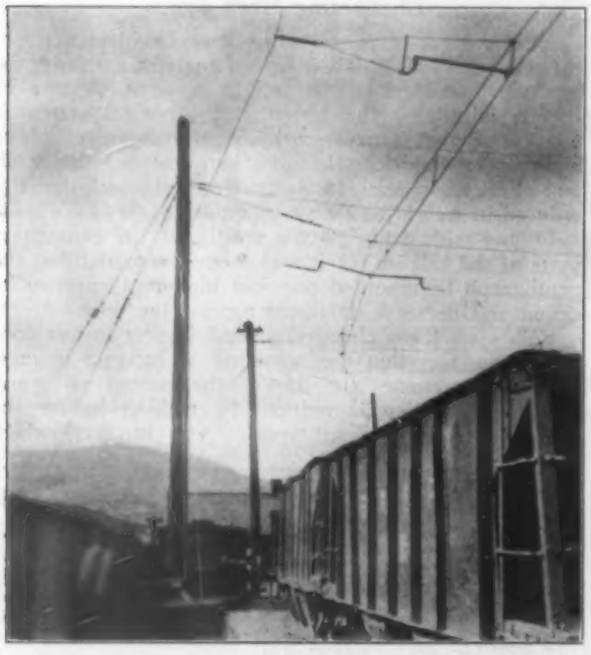
As a very large percentage of the trackage electrified is curve construction, 22 deg., it was necessary to give most careful attention to the design of pull-offs. To maintain flexibility a pull-off using two wires attached to the messenger and trolley wires, with a strut between,

was used. This construction maintained the pull parallel to the horizontal plane of the trolley wire but allowed free vertical movement independent of the messenger. These curves had to be carefully aligned in view of the narrow roller used. While satisfactory results have followed, it is worthy of note that the results are costing more than is the case where a wider contact device is being used.

The East Anaconda yards which are the largest yards on the system, contain 15 tracks, inclusive of that for the main line, constituting approximately five miles of aggregate trackage. Eight of these tracks run almost the entire length of the yard, which is approximately one-half mile in length. These eight tracks are spanned by a 5/8-in. steel strand cable under which is run a 1/2-in. steadying span. Both spans are insulated near the poles which are placed 110 feet apart. Since the wiring of the original eight tracks, four additional tracks have been added to the north which required that a third line of poles be set in order to provide supports for the wires. Three dead-end tracks were handled in a similar manner on the south side of the yard.

Some Construction Hints

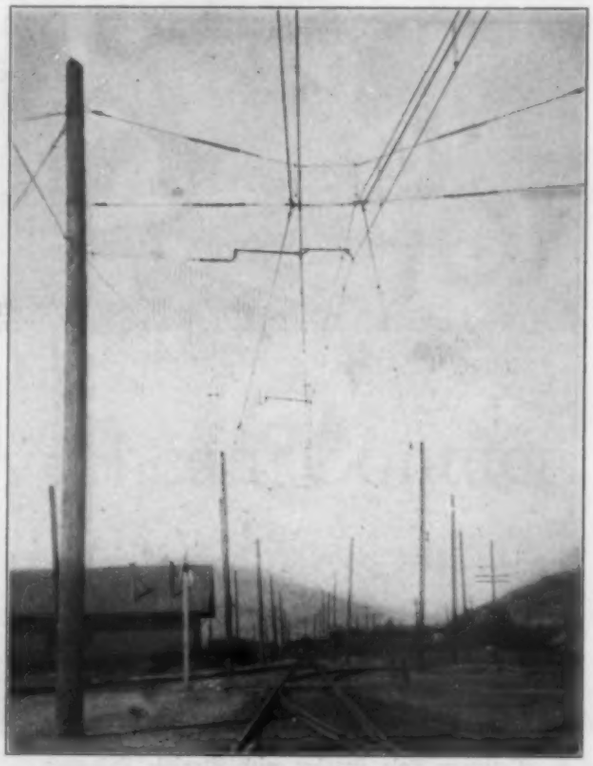
A serious mistake frequently made during the construction period is that of not allowing enough sag in



Type of Overhead Used for Breaking from Tangent to Heavy Curve (2 Tracks) Showing Single Pull-over with Strut, Double Pull-over and Rigid Curve Hangers

the single-track span wires. After a few years the track may be re-surfaced. The side guys are then pulled to correct the trolley height with a result that both the down guys and span are under a greater strain than that for which they were designed.

Insofar as the catenary system is concerned there has been no very radical departure since the installation. At switch points the additional contact and messenger wires were started a span ahead of the switch, from a convenient point for dead-ending, and several inches above the horizontal plane of the through wire and gradually brought down to the same plane a short distance ahead of the switching point, where they were carried over their respective tracks. On numerous occasions two and three dead-ends were made on the same pole. This was poor practice for the reason that no pole can withstand the crushing forces that result from the pull of the dead-ends in one direction and the guys in the opposite direction. All poles were generously shimmed but even so the tops of numerous poles were literally squeezed off.



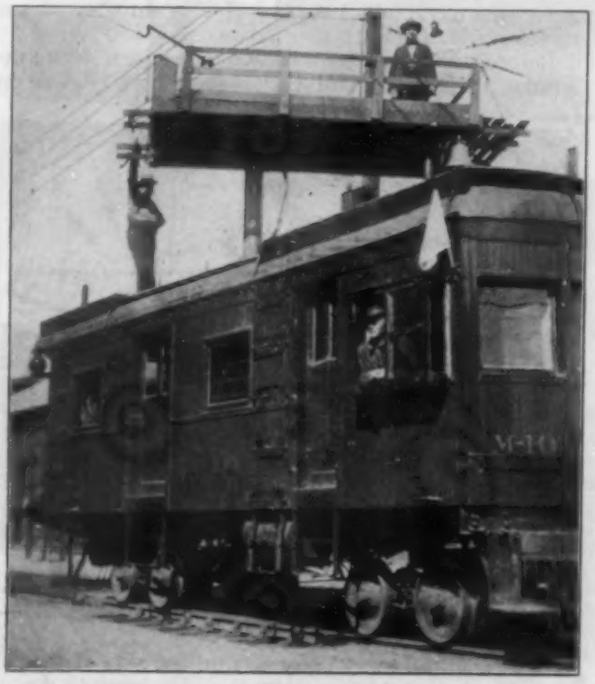
Flexible Pull-over to Pole, Opposite Adjustable Pull-off Link. Flexible Pull-over with Strut and Backbone, and Two Dead Ends on Opposite Sides

Another important point to consider is replacement work in the event of certain units failing.

Trolley dead-ends are made as soon as possible after having risen above the plane of contact. By so doing much copper can be saved and a great deal of unnecessary weight eliminated. It may be advantageous in some installations to carry two wires parallel for a considerable distance in order to distribute the wear on the contact wires, as for instance in the throat of a much-used yard.

The main line is sectionalized by means of air-brake anchor construction. Instead of inserting a wood section insulator in the trolley wire and a suitable insulation in the messenger cable where sectionalization was desired, the ends of the trolley and messenger wires of each section are made to overlap each other the length of a pole spacing, the two wires being carried about eight inches apart, for a few feet in the middle of the span, from which point they are gradually carried above the path of the collector to the dead-ends and anchorage. This construction avoids the use of heavy insulators, thus preventing the hard spots in the line which are destructive to the line and pantograph alike. With this construction full benefit may be gained from the elasticity provided by

wood poles and catenary suspension which overcomes to a great extent the difficulty arising from contraction and expansion caused by changes in temperature. These sections are passed at full speed without any noticeably damaging effect on the contact wire or roller. In yards where the speed is less, wood section insulators are used, which are equipped with flexible runners on the sides. These runners are attached to brackets which hold the contact strips several inches from the wood side sections, and are so designed as to give continuous contact in order



Tower Car with Pneumatically Operated Platform in Raised Position

to eliminate any burning caused by a power arc drawn by the traction motors or more especially that caused by the auxiliary apparatus.

Wood Insulators Are Being Replaced by Porcelain

Wood-strain insulators were used throughout. After most of them had been in service for 14 years, it was found that they had withstood the test and could remain in service for some time to come. Nevertheless all these insulators that are under heavy load are being worked out as rapidly as it is convenient. Replacements are being made with a high-strength interlocking porcelain insulator. Three types of the latter are used—a small 2,200-volt insulator, two in tandem on all pull-offs and sustainers, a 4,400-volt type on all light strains, and a 6,600-volt insulator for all heavy loadings. These insulators have a mechanical working strength of 7,500, 12,000 and 20,000 lb. respectively.

Most wood-strain insulator failures are directly attributable to an accumulation of smelter dust which occurs in the vicinity of these plants. This dust does not cause trouble until it gets wet. The large type porcelain insulator mentioned has been used in the dust area for seven years without a single failure.

Maintenance Forces and Equipment

The maintenance men are stationed at Anaconda principally because of the advantage to be had in living conditions. The ideal location would have been midway had conditions permitted. Maintenance work started in October, 1913, with a crew consisting of a foreman and two linemen. A gasoline car equipped with an extension ladder provided means for transportation and facilities for working on the trolley wire. It was obvious that this contraption was only a makeshift to be operated until adequate equipment could be obtained. Subsequently a one-and-a-half ton Federal truck, equipped with a Trenton tower was placed in service. The platform measured 4 ft. by 9 ft. and was protected with guard rails. Requisite working protection was obtained by insulating the tower from the frame and then by insulating the platform itself. The tower was substantially built of wood and well ironed, therefore it provided but little insulation in itself. For twelve years this car gave excellent service. However, it proved to be too small and the reverse speed, which was comparable with that of an auto truck, was too slow. To avoid running to wyeing points it was necessary to carry a turntable.

Tower Car

In order to expedite maintenance work it was necessary to provide a tower car that would meet the following requirements and specifications; ability to cover the system with a safe speed of about forty miles an hour, and to operate at the same speed in either direction. It should have an independent power unit, preferably have two four-wheel trucks, and a suitable cab mounted on a three-point suspension. The platform should lower to the roof so as to avoid unnecessary top heaviness while running and should be proportioned so as to furnish ample working space. The platform on such cars is usually mounted so as to overhang, permitting a man to step onto a pole when it is swung to the side.

The tower on the car selected is operated by compressed air. The control valves are mounted on the platform. Three separate valves are used—a supply valve, an exhaust valve, and one to operate the air brake which holds the platform in the position desired. Twenty-five to thirty pounds pressure in the eleven-inch cylinder will raise the platform, the amount used depending upon the load. The cylinder is insulated from the frame and cab, the air connections being made through rubber hose. Additional insulation is provided by insulating the platform from the supporting structure and in the wood underframe and floor. All wood parts of the tower and platform, except floor, are of ash. Guard rails are provided on all four sides. The car has an Edwards railway motor car chassis of 14 tons capacity. It is equipped with a 75-hp., 16,000 r.p.m. gasoline engine connected to both axles of the rear truck by a chain drive. The wheels are made of cast iron and are 24 in. in diameter. The transmission provides four speeds in either direction. The car will negotiate a 20 deg. curve in either direction and is equipped with air brakes, lights, whistle, bell, sanders and safety appliances.

The front truck is equipped with a cradle of simple design which functions in such a manner as to maintain a rigid central position when passing over straight track, while on curves it provides a yielding adjustment that greatly assists in minimizing the effect of objectionable lateral trust. The rear truck consists of side and cross members constituting a rigid unit from which, as in front, the frame is supported by means of automobile type springs. The chain adjustment and rear truck alignment is maintained by radius rods.

Two air compressors are required with a combined displacement of 18 cu. ft. The 6-ft. compressor is sufficient to maintain an adequate pressure for braking and

general use. The 12-ft. compressor is cut in when the tower is being operated, and at other times when additional air is required. The car is equipped with a No. 4 Little Giant reversible air motor for boring poles in connection with stubbing, etc.

Three sheave blocks ranging from fours to sixes reeved with the best manila rope are furnished as standard equipment. New or practically new rope is used in all the blocks. When this rope becomes worn it is used for pulling guys. This practice has been justified by the reduced risk of cordage failures and possible injuries to the members of the crew.

Snap-on ratchet wrenches are furnished, two sockets being provided to save time. In place of using the standard receiver plug, which accommodates one socket, a new receiver plug is used which is long enough to take two sockets of the same size, which are placed in the proper position on opposite sides of the ratchet handle. All equipment is inspected each week and replaced when not in first-class working condition.

Maintenance Routine

The routine followed by the line crew, which normally consists of three men, requires that the major portion of the work be done in the summer months. When the frost comes out of the ground, about May, a number of anchors must be reset each year. Creosoted pine slugs are used which vary in size in proportion to the loading.

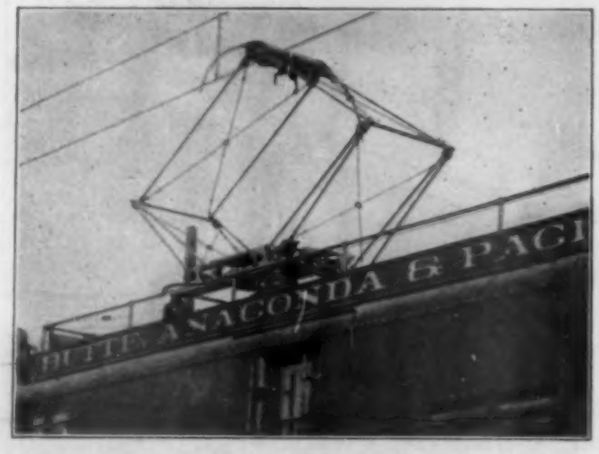
Creosoted Stub in Place. These Are Located on Track Side Only When Pole Is Set on Sloping Grade and Where There Is Proper Clearance

These are buried in the ground not less that five feet deep using the proper size iron rod which may be galvanized or copper clad. In those places where copper water is present and would attack a galvanized rod, the copper-clad rod has given excellent service. The eye is formed by taking a turn-and-a-half twist and the copper water is excluded at the bottom by means of a special cap nut.

All guys are pulled where it is necessary to correct trolley height and to some extent the alignment. Slack is usually pulled from points where sleeves have been inserted. It is obvious that pulling slack requires considerable experience when one considers that a variation of 150 deg. may occur between summer and winter. A great many failures occurred during the first year due to defective brazing and to the splicing sleeves not holding. The sleeve was redesigned with the result that splicing troubles were eliminated. A saw-tooth wedge was used and is equally dependable on new or worn trolley wire.

Anchor slugs have failed more than any other unit in the contact system, the percentage of failures being dependent upon the material used. Where creosoted slugs were used the results have been highly satisfactory and therefore all slugs are now creosoted.

Before stubbing, a crew of two men is sent out to determine the condition of each pole. This is done by removing 12 in. to 18 in. of dirt on one side of the pole and then boring a ¾-in. hole at an angle of 45 deg. to the center of the pole. The condition of the pole is determined by the borings and the hole then filled with "cres-oil" and a plug driven in to exclude the water. Poles were marked for immediate or future stubbing depending upon their condition.



Type US-122, Form D, Pantograph; Spring Raised and Air Lowered with Roller

It was apparent in connection with stubbing poles that too may span structures had been used in the original installation, especially on curves, where a single pole and bracket would have answered the purpose much better. The bracket construction is easily kept in line and has the advantage of maintaining the trolley wire at the desired height with practically no maintenance expense.

Table II—Cost of Overhead Maintenance for the Year 1925

Cost per mile per year	$179.32	
Number of miles operated	123.00	
Average cost per mile, past 5 years	144.85	
Poles and fixtures	39.50	Per cent of total
Feeders	5.10	
Trolley	32.50	
Bonding	23.20	

These figures are unusually high due to stubbing 200 poles.

In view of the fact that more than the usual amount of curve, cross-overs, switch-backs, sags and humps are wired, the maintenance expense for the overhead contact system is not high. An analysis of the cost for the year 1925 is given in Table II. While the figures for the past few years have been higher than was anticipated they can be justified by the fact that many replacements and adjustments have been made admost daily to accommodate the ever-shifting scenery of a thrifty mining region.

Thames River Bridge, New London, Conn.

New Haven Dividend Possibility

Second and concluding part of article deals with record-breaking traffic, improvements in freight service and increased efficiency

THERE is a general impression in many sections of the country that New England is slipping back industrially. This is not borne out by the New Haven's freight traffic figures. The latest revenue ton-miles figures available are those for 1925. These show that in that year, as compared with 1916, the New Haven had a 21½ per cent increase, whereas the increase in the eastern district as a whole was only 1.1 per cent. The comparison is made all the more pertinent if it is realized that in 1916 the industrial area served by the New Haven was busy on munitions. The increase in traffic shown for 1925 has since continued. The net ton-miles figures (including both revenue and non-revenue freight) for the first 11 months of 1926, recently reported, show increases as compared with the same period of 1925 of 8 per cent for both the New Haven and the eastern district.

Record-Breaking Freight Traffic

In 1926, as a matter of fact, the New Haven moved a record-breaking freight traffic, exceeding totals which in earlier years would have been considered beyond the road's capacity, and it moved this traffic with a degree of expedition and satisfaction to the shippers such as has never before been experienced. Prior to March, 1926, the greatest number of gross ton-miles handled in any month of New Haven history was 900,213,000, this record having been made in October, 1919, at a time when coal was being rushed into New England in anticipation of a coal strike. In March, 1926, the total was 941,927,000 gross ton-miles, in this case the record resulting from the settlement of another anthracite coal strike and from an accumulation of traffic held back by two severe storms. In October, 1926, however, a new record was set up of 978,976,000, and November was nearly as high with 955,613,000.

During the period since the war the New Haven's freight car miles per month never reached 23,000,000 until the summer of 1925. In August, 1925, when again coal shipments were high preceding the anthracite strike which began on September 1, a new record of 24,455,000 was established. In 1926, however, from March through December, every month showed in excess of 24,000,000 and the October and November totals of 26,423,000 and

Northup Avenue Yard, Providence, R. I.

26,255,000, respectively, were the first time that the volume has ever reached or exceeded 26,000,000.

Improvement in Service

While this record-breaking traffic was being handled there was no congestion or delay of any kind. New Haven officers remark that the fact that this maximum volume of business was handled without difficulty is evidence that the property has adequate capacity for the handling of any volume of freight likely to develop within a reasonable period. Indeed, they could go further because in 1926 the road bettered its service rather materially. Because New England is a region of highly diversified manufacture and is in competition with other industrial sections of the country it requires a highly expeditious delivery of its products. The problem from the railroad point of view is complicated by the large proportion of l.c.l. freight, the proportion of such freight on the New Haven being more than double that of most other roads.

Recently the New Haven has so improved its freight service that on a large proportion of its l.c.l. or package car freight it is now offering from important New England points overnight delivery at almost every other important New England point. Similarly it advertises overnight delivery from New Haven points at Port Morris, N. J. (D. L. & W. transfer point), at Port Jervis (Erie transfer point), at Waverly transfer (P. R. R.), at West Albany (N. Y. C.); second day delivery at Philadelphia, Baltimore, etc.; third day delivery at Washington, Potomac Yard, Pittsburgh, Buffalo, or Cleveland; fourth day at Chicago, Cincinnati, Indianapolis, etc., or fifth day at St. Louis. This means that there is given to these New England points about the same delivery as is made available from New York City.

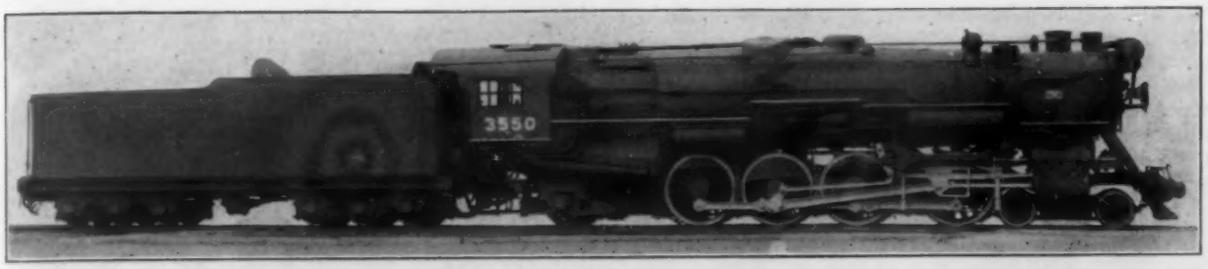
Cedar Hill Transfer—Westbound Hump of Classification Yard in Background

The rendering of the service will depend, of course, upon whether it is necessary to pass a car through a transfer point. Some idea of the large number of through cars available, however, is given by the fact that at Providence, R. I., there are each day 36 scheduled off-line cars to the points mentioned above and others. Similarly there are 51 out of Cedar Hill, the New Haven's general assembly point, or 35 out of Boston. In all, the New Haven operates a minimum of 1,165 scheduled package freight cars of which 859 operate daily and 306 tri-weekly. Of the total, 388 are off-line cars. Many of these classifications are represented each day by more than one car, the volume of tonnage necessitating "repeaters" or duplicate cars to accommodate the overflow. In addition, there are many cars loaded to destination or transfer point not shown in the printed schedule, but made in separate classifications according to the volume of tonnage offered.

When the New Haven improved its schedule to secure the foregoing results, it secured the co-operation of several connecting lines and so radical were the steps taken as to cause changes in schedules even as far west as Chicago. A whole story could be written around the amount of co-ordination required. An important feature was the restoration of a service calling for a morning departure from Maybrook on the Lehigh & Hudson River, Erie or New York, Ontario & Western, and the establishing of l.c.l. cars to off-line transfer points on these roads. Thus the Providence-Port Jervis car reaches Maybrook in the morning, is taken by the Erie to Port Jervis, there transferred in its transfer station and the goods leave Port Jervis in the afternoon or evening in Erie cars to their destination. On the other side, has been the co-ordination of the New Haven's own schedules. Thus, one can take a point like Fitchburg at the northern end of a New Haven branch. From this point there is available overnight service to New York on car load freight (but not on l.c.l. because in the case of the latter the freight has to go through Cedar Hill). To offer the overnight service, a local train takes the car at about noon and delivers it at Worcester about 3:30. There it is taken at 6:15 by another train scheduled to arrive at New London at 9:15. It leaves New London in a third fast freight at 10:15 and arrives at Harlem

The New Car Retarder Yard at Hartford, Conn.

One of the Platforms at Cedar Hill Transfer



Three-Cylinder Mountain-Type Locomotive for Freight Service. This Locomotive Has a McClellan Firebox and High-Pressure Water-Tube Boiler

River at 3 a.m. From there it is delivered by car float to a New York pier at 7 a.m.

This sort of service is costly and it is complicated all the more by the necessity of fitting it in with the heavy passenger service, but the result has been found in a satisfied shipping public and a remarkably favorable attitude on the part of the public generally.

Increased Efficiency

Besides improving its service, the New Haven has at the same time greatly improved its operating efficiency. This is indicated by the 1926 transportation ratio of 34.3, but it will be more apparent in the operating statistics in Table III in which are given the usual comparisons between the figures for 1926 and 1920. It will be noted that as compared with 1920 there was an increase of 33.7 per cent in gross ton-miles but that with this increase there was a decrease of 0.2 per cent in freight train miles, of 0.5 in freight locomotive miles, of 21 per cent in freight train hours and of 16.9 per cent in fuel. The explanation of this remarkable improvement is seen to lie in the increase of 34.0 per cent in the gross tons per train and of 26.1 per cent in the train speed, which affected the phenomenal increase of 69.7 per cent in the gross ton-miles per train hour. The figures for the Central New England are reported separately but are not included here. They show, however, an average train speed of 14.6 miles per train hour and as compared with 1920, an increase in gross ton-miles per train hour of 65 per cent.

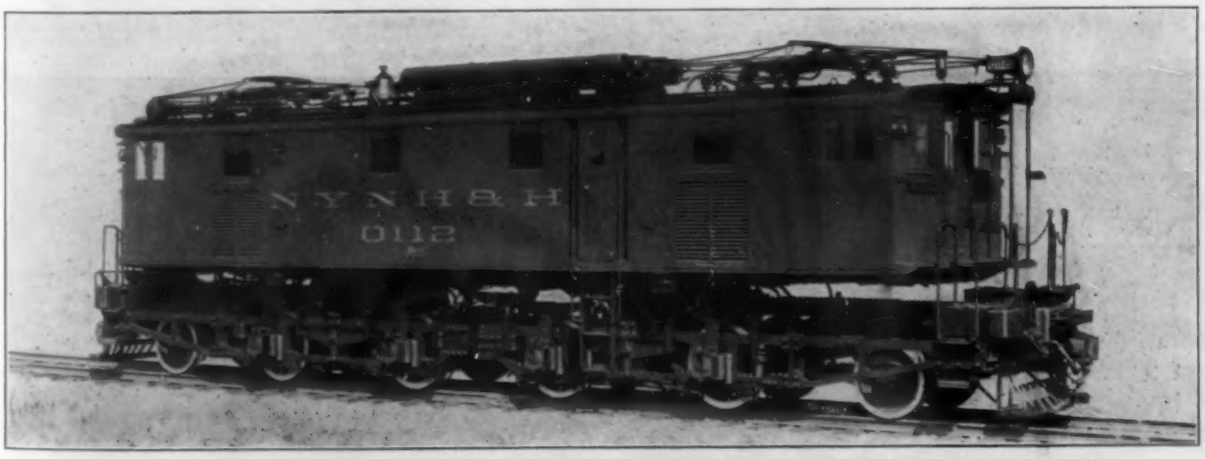
Decrease in Car Load

The decrease in the net tons per loaded car is quite typical of that of most roads as also the resulting great increase in freight car-miles. The improved package car service has had an effect in this direction. Indeed, the New Haven's average load per l.c.l. car in December, 1926, was only 12,005 lb. In July, 1917, when the number of cars for off-line destinations was much less, it was 17,176 lb.

One thing that does not look well in the statistics is the large proportion of bad order cars—in 1926, 15.7 per cent. The New Haven has been reporting a large proportion of bad order cars since the close of Federal Control. Because of speedier operation in recent years its box car ownership has been found to be excessive, and it has followed the policy of repairing only such

Table III—Comparison of Selected Freight Operating Statistics

	First 11 months 1926	First 11 months 1920	Per cent of change Inc.	Per cent of change Dec.
Mileage operated	1,892	1,943	...	2.6
Gross ton-miles (thousands)	7,855,948	5,868,571	33.7	...
Net ton-miles (thousands)	3,225,183	2,724,720	18.4	...
Freight train-miles (thousands)	5,453	5,461	...	0.2
Freight locomotive-miles (thousands)	6,086	6,121	...	0.5
Freight car-miles (thousands)	221,753	154,607	43.3	...
Freight train-hours	469,587	595,139	...	21.0
Tons of coal consumed by freight locos.	568,435	684,762	...	16.9
Car-miles per day	17.0	10.0	70.0	...
Net tons per loaded car	20.9	23.7	...	11.8
Per cent loaded to total car-miles	69.7	74.4	...	4.7
Net ton-miles per car day	247	177	39.5	...
Freight cars per train	41.7	29.3	42.3	...
Gross tons per train	1,441	1,075	34.0	...
Net tons per train	591	499	18.5	...
Train speed, miles per train-hour	11.6	9.2	26.1	...
Gross ton-miles per train-hour	16,729	9,861	69.7	...
Net ton-miles per train-hour	6,868	4,578	50.1	...
Lb. coal per 1,000 gross ton-miles	126	.....	...	...
Loco.-miles per loco-day	55.1	45.4	21.4	...
Per cent freight locos. unserviceable	15.8	24.4	...	8.6
Per cent freight cars unserviceable	15.7	7.3	8.4	...



One of the New Motor-Generator Locomotives for Road Freight Service

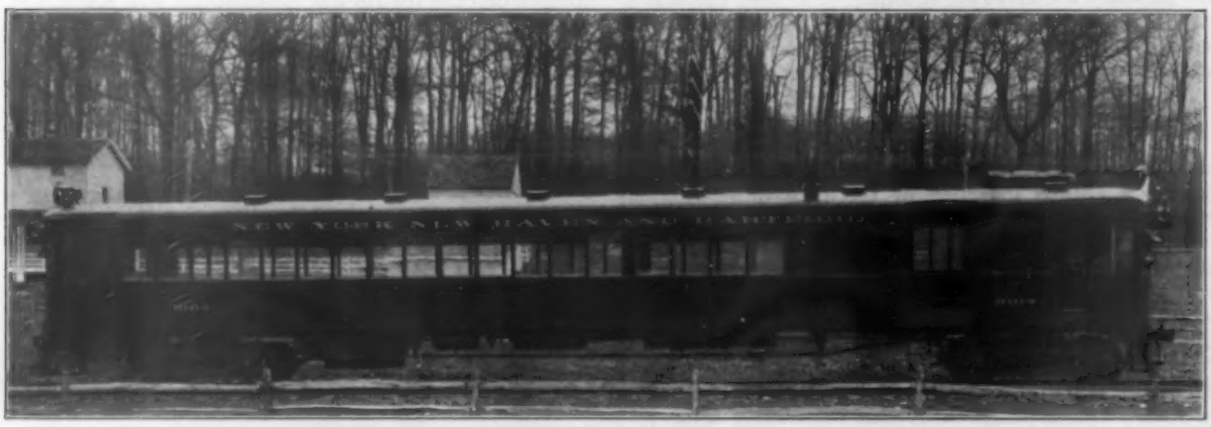
cars as could be placed in revenue service with the retirement of such excess owned cars as have served their time and are no longer necessary. In this some explanation may be found of the increase of $1,000,000 in maintenance of equipment expenses in 1926 as compared with 1925. This increase was due to a large charge for retirements of equipment as evidenced by the following figures:

	Freight cars owned	Passenger cars owned	Locomotives owned
January 1, 1925	35,031	2,507	1,255
January 1, 1926	33,876	2,279	1,160
January 1, 1927	29,551	2,201	1,075

Explanation of Improvement

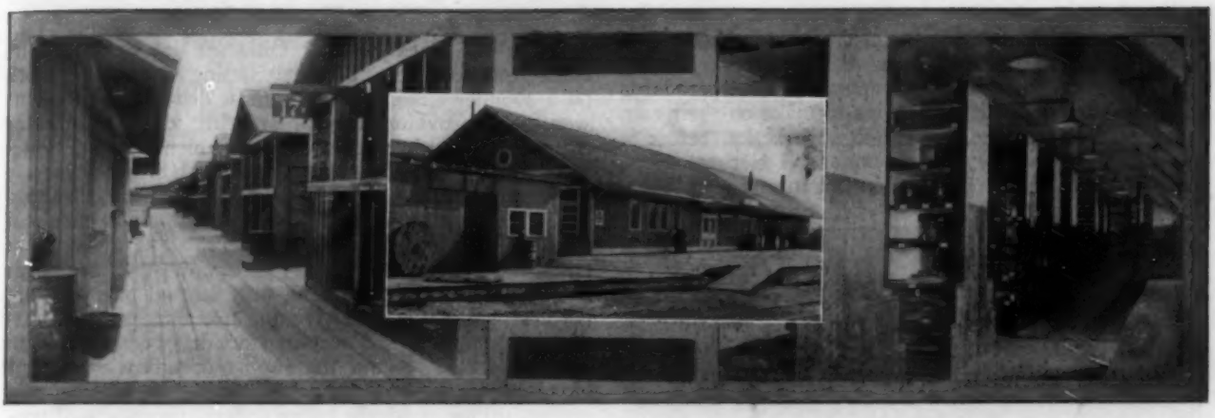
Space is lacking to explain how the remarkable results shown in Table III have been brought about. One important reason, of course, has been heavy capital expenditures. The New Haven is handling over its four and six-track electrified section between New York and New Haven, which is, by the way, the most comprehensive electrification in all its branches in the country, the largest traffic handled electrically by any road. The New Haven has been one of the leaders in the use of modern power both electric and steam. It has a considerable number of three-cylinder locomotives, eleven of which are equipped with high pressure boilers. It was one of the first roads to use color light signals. It is said to have installed more low voltage switch machines than any other railroad. It operates at Hartford one of the country's five yards equipped with car retarders. Its yard at Cedar Hill is one of the largest hump yards in the country and is sufficiently busy so that in October it forwarded daily 3,318 cars or about one every 13 seconds. At the same time the road is one of the largest operators of gasoline rail-motor cars and its bus subsidiary with its 191 buses is the largest operator of railroad owned bus lines. The New Haven would seem, accordingly, to have shown itself particularly receptive to progress in the railroad art and to have benefited therefrom in a quite satisfactory degree. Large sums have also been invested in yards, notably the new yards at Cedar Hill, Providence and Hartford, in other terminals and in bridges, etc., to permit the use of the heavier power which has been acquired.

There is included in Table II a column showing the actual net expenditures for capital improvement in recent years. The total for the ten-year period, 1916 to 1925, was $58,575,898. It would appear, considering the uses to which this money was put, as if the New Haven were an unusually interesting example of the manner in which a railway, even though already having a large capital investment, is called upon to make additional large investments of capital so as to make possible large operating economies. The final result is that today the road is built and maintained to the high standard required by the kind of freight and passenger service which it offers.



The New Haven Is One of the Country's Largest Users of Rail-Motor Cars

Three "Centuries" (Right) Ready to Leave La Salle Street Station, Chicago



Present Supply Conditions on the C. & O.—Left to Right: Car Lumber at Huntington and the Signal Store at Barboursville

C. & O. Profits From Simpler Stocks and Better Planning

22,000 *items of stock eliminated by systematic studies— New control methods adopted**

IT is axiomatic that if material could be purchased and delivered as the need developed for it, there would be no occasion for carrying stock, but since this is seldom yet possible, escape from carrying too voluminous supplies lies (1) in the degree to which the speed of procurement can be increased, (2) the degree to which the time required for procurement can be determined beforehand, (3) the accuracy with which the need can be determined beforehand, (4) the extent to which purchases can be limited to actual needs as distinguished from wants, and (5) the extent to which the range of requirements can be narrowed down. How far can a road get in these directions? The Chesapeake & Ohio has answered the question with a new method of purchasing, bureaus of planning and stock control, and magnified simplification.

The aim of simplification work on the Chesapeake & Ohio, as on other properties and in the industries, has been one of progressively eliminating from the stock carried all obsolete, inactive and unnecessary material, and by the process of standardization and sifting not only to reduce the types, sizes and varieties of material to the smallest number, consistent with the needs of the railroad and the cost of handling involved, but also to do this with a full view to the problems of manufacture and purchase. The advantage is large to a road that can simplify and standardize its stock. This was appreciated by the supply organization on the Chesapeake & Ohio and its simplification work, therefore, became one of the personally supervised functions of the superintendent of stores, who maintains his office at the system headquarters in close touch with the heads of other departments. With this attention given to the subject by the supply organization and with all others understanding the need for co-ordination, a program of simplification has been followed in recent years which attained marked results.

The plan has been to take each class of material and

*This is the second article on the Chesapeake & Ohio's recent accomplishments with materials and supplies. The first article, in which the road was reported to have reduced its stock of material 60 per cent in six years without impairing service, was published in the issue of March 12.

A Representative Yard of Locomotive Castings as They Were Collected and Segregated and Marked Preparatory to the Work of Simplification and Reduction

study, through committee action, every shape and size for the possibility of eliminating it or consolidating it with others. The supply department, moreover, is not only immediately informed of any change of standards which the using departments wish to make on their own initiative, but must be a party to such action before it can become effective. Thus, under all circumstances, the interest of the supply department in any change re-

In the Old Car Material Store at Richmond Before the Reorganization

ceives consideration and it learns of all changes in time to make necessary arrangements for them. Where an article is eliminated, or a substitution or addition made, the Chesapeake & Ohio plan provides for the systematic correction of all records, including stock books, so that items eliminated will be marked eliminated, and their substitutes, if any, designated, while all material found obsolete will be quickly gathered and disposed of.

The effect with which the standardization and simplification work has been conducted on the Chesapeake & Ohio is indicated by the fact that a total of 6,581 items were eliminated from stock last year, among which are 469 sizes of bolts, nuts and rivets, 227 sizes of springs, ferrules, tubing and brass bars, 251 sizes of boiler, firebox and tank steel, 183 sizes of steel bars and shapes, 760 brass castings patterns, 122 lubricator parts, 169 coach trimmings, 2,076 iron and steel castings, 1,289 fabricated steel car parts, 149 items of lumber and 179 items of stationery. Other items which were eliminated include the following:

Description of materials	Sizes eliminated
Boiler tubes	18
Cable, handles, lagging, nails	14
Shelf hardware	70
Set, cap and machine screws	82
Wrenches, grinding wheels	49
Pipe fittings	141
Hose and hydrant cups	12
Station and train supplies	14
Crank pins	85
Freight car parts	122
Couplers	6
Engine, truck, driving and trailer axles	94

In the mechanical department, where one man spends all of his time on standardization and simplification work, over two car loads of obsolete patterns were burned as a result of this work. In the six years of supply improvement work on this road, the total number of all varieties of material carried on the railroad has been reduced from a total of 54,000 to approximately 32,000 by the elimination through scrapping, standardization or simplification of no less than 22,000 items.

Better Planning Helps

When the Chesapeake & Ohio set out to reduce its stock balances and put its purchasing and stores work on a sounder basis, one of its most disturbing problems was the improvident way of ordering and planning for material. A division has a building, which it suddenly decides to repair. Quantities are estimated, often by merely recollecting what has been used elsewhere and adding 25 or 50 per cent for safety, and the supply department is called upon for a rush shipment. The storekeeper takes the disbursement at its face value and gages his own order for replenishment, only to find later on that the first order was excessive and not a measure of current consumption, and surplus stock has been created in both instances. Again the supply organization strains to secure the material for a box car repair program that springs up too suddenly for an orderly procedure of procurement, only to learn as the materials finally begin to arrive that the program has been delayed or curtailed and preparations are in the making for repairing steel gondolas, and the material lies on platforms and is carried on the books, taking up space, keeping turnover down and accumulating interest charges, and often repeated handling charges, until it can eventually be used or otherwise disposed of.

The gravity of this problem on the Chesapeake & Ohio is illustrated by the fact that as late as 1924 investigation made within the stores organization to determine the reason for failure on the part of various storekeepers to reach the ideal turnover of 50 per cent in their total stock and to devise ways of accomplishing it, while disclosing many weaknesses in stores department practice, also revealed imposing accumulations of stock that were traced to over-ordering and lack of thoroughness on the part of users in planning work and carrying out

Statement of Items

Called For, Supplied and Short

Month December 1926 — Huntington Store

Date	Items Called For	Items Supplied	Items Short	Explanation
1	1981	1935	46	
2	2081	2040	41	
3	2074	2035	39	
4	2147	2105	42	
5	213	202	11	
6	2119	207	48	
7	23		52	
			48	
		189		
	2114	2073		
19	227	220		
20	2068	2012	56	
21	1927	1863	64	
22	2400	2343	57	
23	2221	2158	63	
24	2050	1991	59	
25	221	211	10	
26	266	253	13	
27	1955	1894	61	
28	2264	2200	64	
29	2158	2104	54	
30	2310	2276	34	
31	1878	1832	46	
	57353	55935	1418	97.53 per cent

programs. One small store had $40,000 of steel car material, which was no longer wanted. At another place $62,000 of bridge timber was left on hand because the work for which it had been ordered was abandoned. Out of $600,000 of steel car material at the general store, $352,000 was surplus, which had been ordered on special requisition two years previous, but not used.

The cure of such evils is not the work of a single day, but the solution, of course, lies in progressively improving planning and control. A vital step in this direc-

tion has been to sectionalize the stock and by issuing comparative statements of stock on hand, by conferences, etc., to put the responsibility up to each section stockman to avoid surplus, also by impressing the organization that a storehouse should be a distributing point, not a reservoir, and that a storekeeper will be criticized more for having too much material than too little, a policy which depends for its justification on the experience that the storekeeper who turns his stock over regularly usually gives better service than the storekeeper whose stock is large. However sound the policy may be, it is observed on the Chesapeake & Ohio that little material occupies the pockets and platforms at any but the general store.

The responsibilities have not been limited to storekeepers, however, for definite rsponsibility has also been assigned to the users. In this connection two rules are of particular interest because of the illustration they afford of the method of developing this responsibility. The first is that when any material ordered for construction purposes is shipped from the store stock to the site of the work, it shall be charged off the stores balance, a rule which is out of line with the customary practice on the railroads, but which was adopted on this road when a 168-page report representing a two months' inspection disclosed a looseness in the handling and accounting for materials that won the management over to the theory that more provident ordering and better co-operation with the supply department in planning needs would result from getting the charges for material into the accounts in the same month that the supply department was called upon to make deliveries where

A Yard of Castings and Steel Car Material Before the Reorganization Showing Conditions Which Better Planning Prevents

they would show up and invite explanation when out of line with efficient practice.

Measure Service by Records of Shortages

The second rule is that whenever materials are ordered which are not carried in regular stock or when stock items are ordered for special work not covered by normal consumption, these orders must be approved by the department head, stipulate definitely when the material is to be delivered and commit the user in a statement typewritten on the order that such material shall be used when received. Material not used is returned to store stock and again recorded on the store inventory, but not before the whole transaction has been investigated and the responsibility fixed for the error in over-ordering or calling for deliveries too soon, etc. The underlying objective in all this is to promote the use of material in the month received.

It is also the practice that when the material which is

A Sample of Improvement Work in an Old Storehouse

not used when received is of a special character not suited for any other purpose, a record of such material with the cost of it, is prepared on a form called a non-responsible list, which carries a full explanation of the transaction for the guidance of the authorities in fixing responsibility and taking the necessary steps to dispose of it and prevent similar faults in the future.

Another rule is of benefit in keeping the users as well as stockmen alive to their responsibility in getting material. Whenever a store fails to fill an order for material which the store has the responsibility to keep in stock or which it has obligated itself to order and deliver to the user, a report is made, called a short report, containing the items missing and the signature of the user. To promote the use of this report, it has been agreed that no complaints of shortages will be considered in the absence of the short report.

The short report also constitutes a measure of the service given by the supply department, and it is utilized for that purpose. This is done by preparing a monthly statement at each store, showing for each day during the month the number of items called for, the items supplied, and the number of items short. This report, a copy of which is reproduced in an accompanying illustration, is submitted to the superintendent of stores each month for investigation and the percentage of items filled to the total number of items called for is taken as the service given by the store that month. Obviously the service is 100 per cent if all pertinent items are filled when called for. As the tabulation in the previous article shows, the service of the supply department as a whole averages 99 per cent per month.

No account of planning and control in supply work on

the Chesapeake & Ohio is complete that overlooks the changes made in handling forest products.

	Cross ties	Lumber ft., B. M.	Switch ties ft., B. M.	Piling lin. ft.	Tlgph. poles lin. ft.	Fence posts	Costs
1921	1,078,199	15,260,525	2,644,488	61,430	20,458	10,943	$2,150,374
1922	1,461,070	15,817,547	4,090,864	103,722	27,885	8,705	2,033,698
1923	1,730,916	19,204,690	5,422,200	194,026	45,100	14,744	2,757,350
1924	1,506,240	19,235,774	4,644,032	117,020	85,490	7,476	2,274,625
1925	1,374,355	21,631,502	4,089,453	162,904	61,158	8,054	2,206,062
1926	995,047	21,900,626	3,900,126	182,826	116,891	9,652	1,863,117
Total	8,145,827	113,050,664	24,791,233	821,928	356,982	59,554	$13,285,228

In the six years ending December 31, 1926, this road purchased 8,145,827 cross ties, 113,050,664 ft. bm., of lumber, 24,791,233 ft. bm. switch ties, 821,928 lin. ft. of piling, 356,982 lin. ft. of telegraph poles, and 59,554 fence posts, costing all told, $13,285,228. Prior to June, 1921, all lumber was obtained through brokers. All of these agreements were cancelled and all forest products are now purchased from the producers. This practice has saved the company large sums, particularly in view of the success it has had in increasing the volume of forest products produced in the territory tributary to its lines. No inquiries for prices are sent out for this lumber. The purchases of home products are made through personal contact with the producers and all

In the Car Material Section at the General Store

payments are made by sight draft, prepared by the tie and timber agent from memoranda made by the inspectors when the material is loaded for shipment.

The most interesting change in the forest products work occurred in 1924. At that time maintenance of way materials, including lumber, were under the supervision of the maintenance department. When the orders were received from the various divisions upon which to base purchases for the next year's work, the supply department queried its accuracy and the matter was referred to the engineer of maintenance of way, who cut the requisitions 30 per cent. When the report was still further questioned, it was arranged that the tie and timber agents and the general bridge inspector should go over the entire railroad and check every requisition against unfilled orders and the need as determined on the ground. The inspection lasted four weeks and the result was a further reduction in the maintenance of way estimates for lumber of 1,456,000 ft. Now roadway materials are included in stores stock, but it has remained the practice for the tie and timber agent, accompanied by the supervisors of bridges, buildings and track, and often by the division engineers, to go over every district each year and determine the lumber requirements, after which the engineer maintenance of way compiles the data by divisions and prepares blanket requisitions on the superintendent of stores.

This practice has produced results, not only in confining orders to actual needs, but by insuring that in every instance the requisitions shall be made with a view to the unfilled orders, the use of all material on hand, standardization efforts, best time and place of delivery, etc. All lumber purchased for roadway programs is stored at Huntington, and the cross and switch ties are stored at the treating plant, where they are held until orders for delivery are submitted by the division forces. It is estimated that this plan has reduced purchases by approximately 2,000,000 ft. a year.

The efficiency with which this work is now handled is evidenced still further by a hand book which has been compiled by a joint committee on this road and gives in a condensed but complete form all specifications governing the purchase of this material, and detailed instructions on the kinds and sizes of lumber that are to be ordered and used for each kind of work. This book is revised each year to keep it abreast of the latest policies and decisions on the ordering and use of forest products.

Recently this road has started the treatment of bridge ties. During 1926, a total of 8,000 bridge ties were framed and treated at the treating plant, while in 1927, it is planned to frame and treat approximately 23,000 bridge ties, or 90 per cent of the annual requirements.

Bureau of Planning and Control Created

A bureau of planning and control, so-called, is the newest innovation in the Chesapeake & Ohio supply machine. The supply department was authorized to establish it in January, 1926, and it is located at the general store. Only three persons are in the bureau, a bureau chief, a shop routing clerk, and a schedule clerk, but their position in the general scheme is an important one. The name of the bureau and the title of the clerk indicate its function, but it is emphasized that the bureau is not merely one of record, nor does it handle any supplies, but it is distinctly a control unit, created and operated to control the expenditures and reduce the investments as well as to see at all times that the supply service of the general stores is not impaired. The using departments, it is pointed out, have a direct responsibility under present conditions not only to estimate their requirements with care, but also to use the material as planned. It is the function of the bureau of planning and control to check the using departments in this respect. Again the purchasing department has a responsibility to see that dealers fill orders in the time limit agreed upon. It is the function of the bureau to see that the purchasing department fulfills its obligation. In addition, the division storekeepers are required to estimate their requirements accurately, which also subjects them to inspection by this bureau. To express the situation in a nut shell, it was felt when establishing this bureau that the machinery necessary to an efficient service of supply and investment control had been provided but that it remained to guarantee that the machinery would operate effectively.

The first thing the bureau did after its establishment was to develop the monthly consumption of each item in the general stock and mark that consumption in the stock book for the government of all section stockmen in ordering material. Another activity of the bureau is that of periodically going through every paper on the desks of section stockmen in the general store and making a minute audit of all the records to see that the section is functioning. The first step is to check all the orders against the stock book to ascertain if the

stock books have been marked up correctly and that the orders were justified in the first place. The second step is to follow the same procedure with unfilled orders from other stores. The unfilled requisitions on the general store are all counted and checked to see if the items are covered by store and purchase orders. An account is made of all short reports, a check made of all receiving sheets, and finally a comparative statement is made of the requisitions, store orders and short reports found. Meanwhile, the shop routing clerk follows up short reports and keeps in touch with mechanical department programs to determine the progress of work to see that material is delivered promptly.

Comparative Statement of Conditions

SEC. —, GENERAL STORE

Date checked	Unfilled requisitions*	Unfilled orders to purchase	Short reports
6-18-25	87	71	44
7-8-25	47	23	36
8-12-25	47	105	34
9-15-25	51	51	68
10-5-25	69	68	49
11-11-25	33	36	46
2-12-26	67	69	44
3-13-26	66	52	37
4-9-26	72	21	29
5-6-26	71	45	17
6-7-26	56	34	13

*Comprize orders on general store from other stores.

An illustration of this bureau's value is furnished in the comparison between the conditions found in one section as shown by an inspection on two different occasions. On March 27, an audit of one section showed 30 more or less serious irregularities between the purchase orders and the stock book record. A second audit on June 23, showed no irregularities. On March 27, there were 69 unfilled requisitions, consisting of 195 items. On June 23 there were 13 unfilled requisitions, containing but 32 items, all of which were covered by store and purchase orders. The explanation for the difference in conditions in this particular instance lies in the attention which this section of stock received immediately following the first audit. The effectiveness of this work as well as the frequency with which the audits are made are further illustrated in the accompanying report of inspections made over a year in another section of stock at the general store, which shows 56 unfilled requests from outlying stores on file on June 30, 1926, as compared with 87 the year previous, 34 unfilled orders on the purchasing department as compared with 71 the year previous and 13 short reports as compared with 44 the year previous.

In laying last year's new rail, amounting to 45,000 tons, scarcely any fittings were available until the rail reached its destination, but the fittings were then supplied in complete sets and the year's work prosecuted without any delays whatsoever from lack of material, an accomplishment in which this bureau also had an important part.

Wage Statistics for 1926

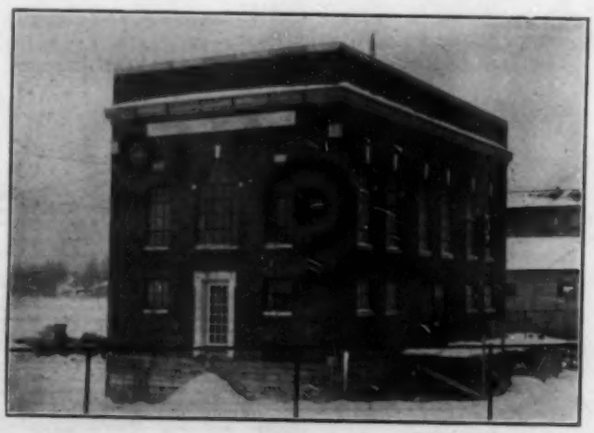
WASHINGTON, D. C.

THE average number of railway employees of Class I roads for 1926 was 1,805,780, an increase of 36,681, or 2.1 per cent, as compared with 1925, according to a compilation made public by the Interstate Commerce Commission, Bureau of Statistics, of wage statistics for the year. The number of employees is the average of the twelve monthly counts. The total compensation was $2,990,441,936, an increase of $90,334,552, or 3.1 per cent. This included $326,543,556 for employees reported on a daily basis and $2,663,898,380 for those reported on an hourly basis. The summary is a consolidation of the twelve monthly summaries issued during the year, with certain minor changes, as the monthly reports do not include adjustments for account of performance in previous months.

The average straight-time hourly earnings for all employees reported on the hourly basis increased from 58.4 to 58.7 cents, and the average daily earnings of employees reported on the daily basis increased from $7.86 to $7.96. The total compensation of employees paid on the piece-work basis amounted to $79,614,435 in 1926, as compared with $72,785,087 in 1925 and $63,276,407 in 1924. The average earnings per hour of piece-work employees were 83.7 cents in 1926, as compared with 82.1 in 1925 and 81.3 in 1924.

The average straight-time earnings per day or hour, by employee groups, and the average annual earnings, are shown in the double column table on this page.

Group	Basis of reporting	Average straight-time earnings per day or hour					Average annual earnings				
		1926	1925	1924	1923	1922	1926	1925	1924	1923	1922
Executives, officials and staff assistants	Daily	$16.85	$16.69	$16.47	$16.17	$15.92	$5,344	$5,296	$5,227	$5,120	$5,029
Professional, clerical and general	Daily	7.12	7.05	6.98	6.85	6.74	2,227	2,203	2,188	2,147	2,115
	Hourly	.589	.584	.579	.566	.564	1,513	1,497	1,487	1,463	1,474
Maintenance of way and structures	Daily	9.11	9.10	8.95	8.92	8.86	2,918	2,917	2,882	2,863	2,835
	Hourly	.432	.431	.429	.422	.416	1,092	1,083	1,068	1,085	1,038
Maintenance of equipment and stores	Daily	8.95	8.95	8.86	8.81	8.85	2,964	2,966	2,943	2,922	2,928
	Hourly	.500	.592	.586	.574	.584	1,517	1,487	1,470	1,513	1,604
Transportation (other than train, engine and yard)	Daily	3.36	3.32	3.28	3.24	3.24	1,195	1,186	1,175	1,157	1,153
	Hourly	.549	.544	.541	.529	.529	1,505	1,492	1,479	1,451	1,446
Transportation (yardmasters, switch tenders and hostlers)	Daily	8.54	8.54	8.51	8.43	8.45	3,119	3,111	3,099	3,060	3,066
	Hourly	.649	.646	.629	.608	.606	1,866	1,849	1,805	1,764	1,763
Transportation (train and engine)	Hourly	.783	.781	.763	.736	.736	2,384	2,357	2,294	2,283	2,224
Total (all employees)	Daily	....	....	....	....	....	$2,607	$2,579	$2,551	$2,518	$2,474
	Hourly	....	....	....	....	....	1,585	1,569	1,544	1,556	1,558



Building Erected at Purdue University to House the Drop Test Machine to Be Used in the Draft Gear Tests Sponsored by the American Railway Association

The 50,000-lb. steel base casting for the drop test machine is now in place on the concrete foundation. Detail arrangements for the tests are nearing completion and it is anticipated that the tests will be actually under way by May 1.

The Station as Seen from the Approach, Outbound Shed at the Left, Transfer Platform in the Center and Inbound House on the Right

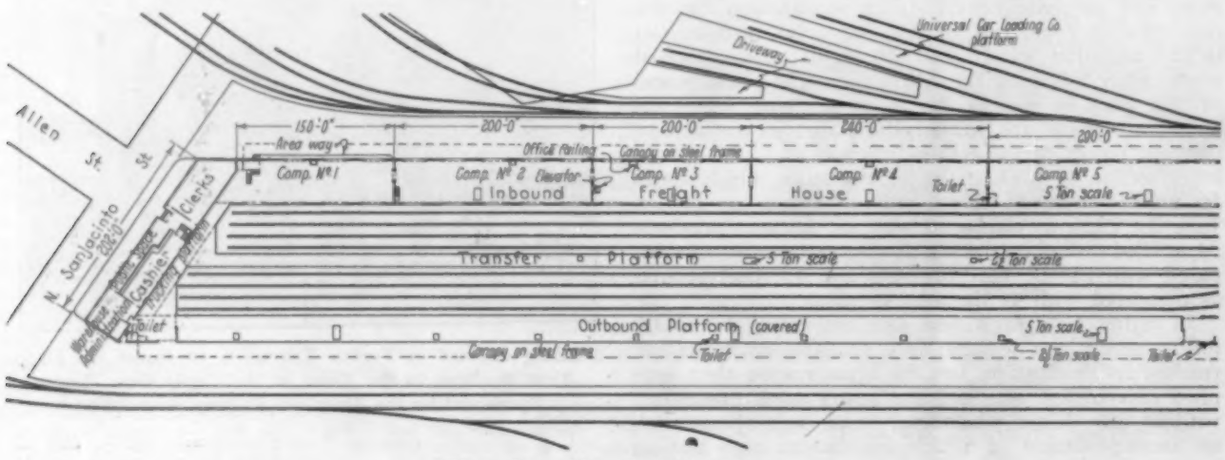
Freight Station Meets Needs of Growing Southern City

Southern Pacific's new local terminal at Houston, Texas, provides capacity for material increase in business

THE Southern Pacific has recently placed in service a freight house and team track layout at Houston, Texas, with a capacity not only for present needs but with sufficient margin for a considerable increase in its business. One of the features of the new construction is an outbound house which consists merely of an open platform protected by a wide overhanging roof. Other features are the large area of concrete roadways, an unusually high ratio of tailboard space to platform frontage, a transfer platform which is operated by the regular freight house forces, and a storage yard in connection with the team yard. The entire layout, which cost $750,000, provides 137,750 sq. ft. of floor space, contains 28,000 ft. of track and 45 turnouts, and there is tailboard space for 270 vehicles.

The l.c.l. facilities consist of separate parallel inbound and outbound houses 116 ft. apart but connected at the west end by a two-story head house which provides space for the agent's clerical and supervisory forces. Each of the two houses is served by a group of four tracks situated in the space between the two buildings. Between these two groups of tracks there is a transfer platform 14 ft. by 1,140 ft., while running the full length of each building on the sides opposite the house tracks there is a concrete pavement 45 ft. wide.

The tracks for the house settings have an aggregate length of 8,800 ft., giving a capacity of 108 cars for each of the houses. By a special arrangement of storage tracks, ladders, and a run around track in the team yard any of the house tracks may be pulled and reset without disturbing any of the others or the team track setting. The transfer platform between the two track groups per-



Plan of the New Freight Station

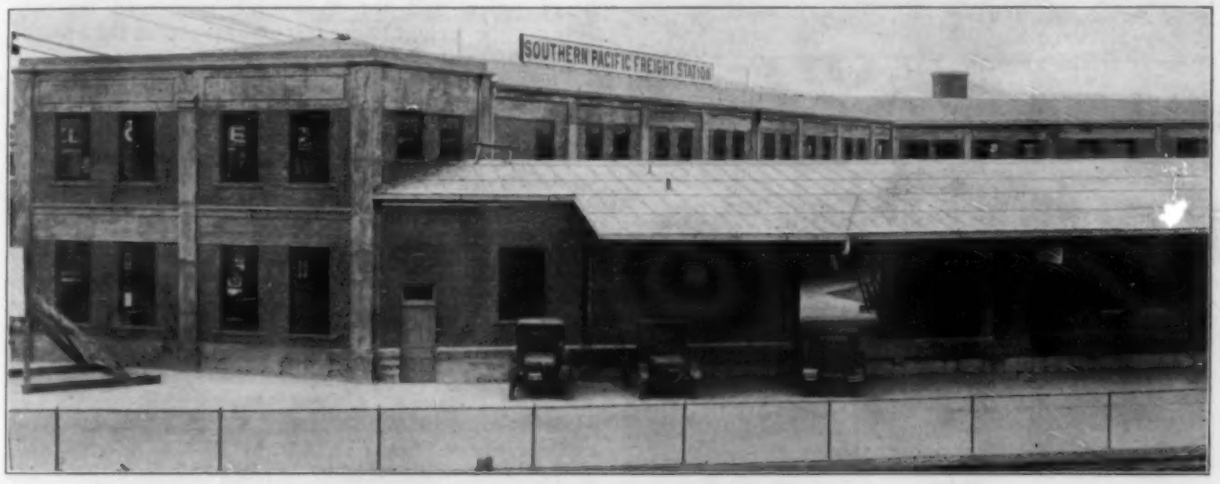
mits the transfer operation to be carried on simultaneously with the unloading of the inbound freight, and this can be done by the regular trucking gangs in such a manner that there is no confusion or interference with the normal operation of either of the houses, eliminating the necessity for a separate transfer organization.

An analysis of the total l.c.l. freight handled through Houston by the Southern Pacific discloses the fact that only 18 per cent is received for Houston delivery through the freight house; while 40 per cent is outbound freight originating locally and is handled over the floor of the outbound house; and 42 per cent is for transfer. The latter includes shipments going to or received from a belt line which serves the port facilities. These figures do not include carload lots received from or delivered to industries having their own tracks, or the tonnage handled on the team tracks, but only the freight passing through the freight houses.

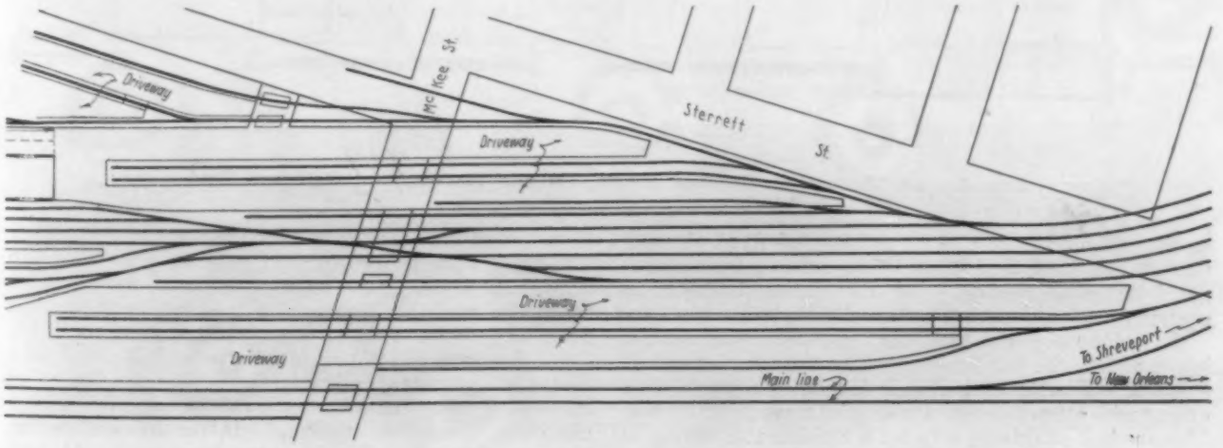
Houston is the center from which a number of Southern Pacific lines radiate and as six other railroads enter the city, in addition to the belt railroad serving the port facilities, there is a rather heavy transfer of freight between the Southern Pacific lines as well as with the other railroads. Furthermore, Houston is a growing city with an expanding industrial development; it is the gateway to the rapidly developing irrigated area in the lower Rio Grande valley, into which the Southern Pacific is now constructing a new line; it has recently enlarged its port facilities and shipments by water are increasing in volume; on the north and east there are well developed agricultural areas which have a comparatively high density of population, so that the city is becoming a distributing center of increasing importance.

The old facilities which are superseded by the new construction consisted of a combined inbound and outbound freight house of frame construction, and a small team yard situated some distance away. Both had become inadequate for the present business and neither could be expanded without complete reconstruction. For these reasons it was considered desirable to replace the old facilities and, at the same time, provide sufficient margin for an increase in traffic, so that reconstruction would not be required in the near future. On this basis the property upon which the team yard was situated was selected as the location of the enlarged freight houses, and the team yard was moved far enough east to clear the buildings. This location has the double advantage of being convenient to the retail district of the city and yet far enough to one side so that much of the teaming does not need to use the downtown streets to reach the freight facilities.

The inbound house is 45 ft. by 1,080 ft. in area and is divided into sections or compartments varying from 200 ft. to 290 ft. in length, by fire walls equipped with fire



Rear View of the Head House and a Part of the Outbound Shed



A Team Yard Occupies the Space Immediately East of the Freight Station

doors, so that in the event of fire the several sections of the building can be isolated. The compartments are divided into 20-ft. bays, and alternate bays have been equipped with sliding steel doors. The brick walls enclosing the one-story part of this structure are carried on concrete foundations with spread footings, while the roof trusses are supported on independent steel columns which rest on the foundation walls. Adjoining the two-story head house the west 350 ft. of the inbound house is two stories high, and the west 150 ft. has a basement.

Office Space on the First Floor as Seen from the Public Entrance

The two-story section of the house is of reinforced concrete construction with brick walls supported on reinforced concrete beams, while the roof trusses rest on reinforced concrete columns along the exterior walls and on steel columns encased in concrete at the center of the house. The interior steel columns on the second floor are directly over reinforced concrete columns in the first story, which also support the second floor. In the one-story part of the structure there are no interior columns so that the entire floor space is clear of fixed obstructions. The steel roof trusses are covered with corrugated asbestos roofing, and the entire building is equipped with an automatic sprinkler system.

All columns in the two story section of the freight house and in the head house, where the same design is followed, are supported on pile foundations which were driven with a track driver working on a temporary track. This method of driving effected a considerable saving in both cost and time, as one of the original team tracks was available for this purpose and it was only necessary to throw it over to the desired position for driving.

Foundation Walls

The sub-soil is a very hard, compact, and nearly impervious yellow clay which made excellent foundation support for the building footings and concrete driveways. Except in the section containing the basement, the space between the foundation walls was filled with clay excavated at the Clinton terminal, which the Southern Pacific was constructing at the same time on the Houston ship canal at the lower end of the Houston water terminal. This material was compacted by means of a steam roller, and the monolithic reinforced concrete floor for the freight house rests on this fill at the level of the top of the foundation walls.

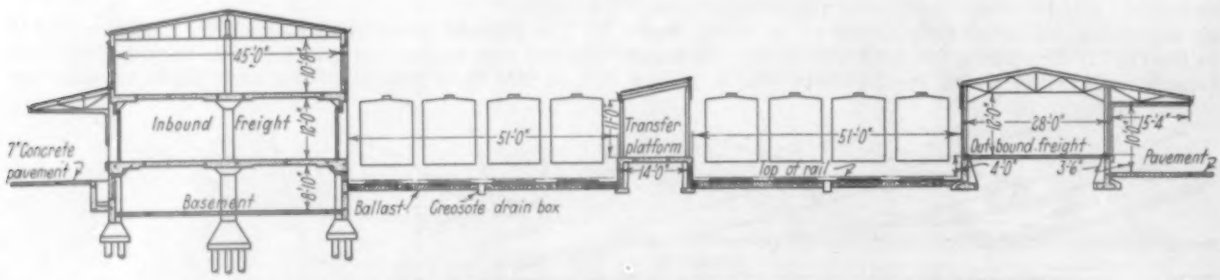
The basement contains the boiler room and other heating equipment and separate men's toilets and locker rooms for white and colored employees in the freight house. Toilet, wash, and locker rooms for the clerical forces are situated on the second floor of the head house.

A canopy 15 ft. wide with a clear height of 13 ft. 6 in. above the surface of the pavement and 9 ft. above the floor of the freight house, extends out over the driveway for the full length of the building. While this canopy is in effect a 15-ft. extension of the roof, it is bracketed to the steel columns, so that it is independent of the roof trusses and, on the two-story section, the steel canopy frame is anchored to the reinforced concrete columns.

The Outbound House

The outbound house is 28 ft. by 1,140 ft. in area, and, as mentioned, consists of a concrete platform which is not enclosed but which is protected by a roof and canopy similar to that of the inbound house. In the comparatively mild climate in this section of the country an enclosure to protect from low temperatures is unnecessary and the method of operation in effect requires that all freight shall be loaded for forwarding before the freight house force is released for the day. For this reason enclosing walls were considered unnecessary and the absence of walls and doors makes the full length of the building available for tailboard space.

The design of the foundation walls and roof structure is the same as already described for the one-story part of the inbound house, except for the difference in width. The space between the foundation walls was filled and compacted in the same manner, while in both houses triangular mesh reinforcing was used in the monolithic floor slab which rests directly on the compacted fill. Platform scales of 2½ tons and 5 tons capacity have been placed at convenient intervals throughout the length of the building, so that shipments can be weighed with a minimum amount of trucking. In the inbound house, however, five-ton scales only have been used. At both



Cross-Section Through the Inbound House, Transfer Platform and Outbound Shed

ends of the platform, rooms about 40 ft. long have been constructed to care for those shipments which cannot be forwarded immediately because of defective marking, lack of shipping instructions, or other causes.

The Team Yard

The driveways serving the two houses extend to the easterly end of the team yard, while two interior driveways and two others along three short spur tracks give a total team track frontage of 141 cars. At the center of the team yard are four storage tracks, having a total capacity of 92 cars, and a run-around track. The storage tracks make it possible always to have cars for the inbound house ready, so that any one of the house tracks can be pulled and reset whenever the setting has been made empty, or loaded cars can be pulled from the outbound house and empties set to replace them. In making these moves a run-around track and a special arrangement of ladders make it possible to do the switching without disturbing the team track settings.

No exceptional conditions were encountered on the work although, near the west end, the abandoned bed of a small creek crossed the site of the buildings and here the ground was quite soft, making it necessary to drive slightly longer piles than elsewhere. The necessity of keeping the team tracks in use until the new team yard was ready for service hampered the building operations somewhat during the early part of the construction period, and made it difficult during this time to organize the work as efficiently as would have been possible otherwise. This situation delayed the final completion of the buildings and driveways somewhat, but required no unusual methods.

The work of clearing the site was started in February, 1926. Work on the building foundations was begun in March, and the entire facility was put in service on November 29.

No Congestion

This layout is an example of modern design in which ample driveway and tailboard space have been provided so that teaming can be done without congestion, and the handling of the shipments to and from cars can be done without confusion and with a minimum force of freight handlers. The team yard is so arranged that there is no interference with the freight house operations, yet it is near enough so that the supervisory forces at the freight house can oversee it and the patrons have easy access to both the agent and cashier.

The design and construction of the entire layout was handled under the direction of H. M. Lull, formerly chief engineer, and now executive vice-president. Dwight P. Robinson & Company, New York, were the general contractors.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading came near the million mark in the week ended March 5 with a total of 994,931 cars. This was an increase of 29,922 cars as compared with the corresponding week of last year and an increase of 62,887 cars as compared with 1925. The increase as compared with last year, however, was accounted for entirely by the heavy coal loading, which amounted to 213,442 cars, or 30,999 cars more than were load in the corresponding week of 1926. The Eastern and Southern districts reported decreases as compared with last year and there were also decreases in the loading of livestock, coke and forest products. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading—Week Ended Saturday, March 5, 1927

Districts	1927	1926	1925
Eastern	235,233	235,567	218,495
Allegheny	205,221	196,404	189,893
Pocahontas	57,403	50,015	42,602
Southern	157,680	160,636	156,226
Northwestern	119,089	115,503	119,446
Central Western	143,089	132,547	139,672
Southwestern	77,216	74,337	65,710
Total Western districts	339,394	322,387	324,828
Total all roads	994,931	965,009	932,044
Commodities			
Grain and grain products	44,932	40,242	44,220
Live stock	28,040	29,446	28,236
Coal	213,442	182,443	164,603
Coke	12,557	14,954	12,806
Forest products	69,240	75,960	81,631
Ore	10,096	9,829	10,276
Mdse. L.C.L.	265,254	264,105	257,715
Miscellaneous	351,910	348,030	332,557
March 5	994,931	965,009	932,044
February 26	923,849	912,935	864,096
February 19	960,873	932,281	925,886
February 12	968,317	917,625	903,935
February 5	970,892	914,491	929,130
Cumulative total, 10 weeks	9,343,611	9,070,597	9,012,040

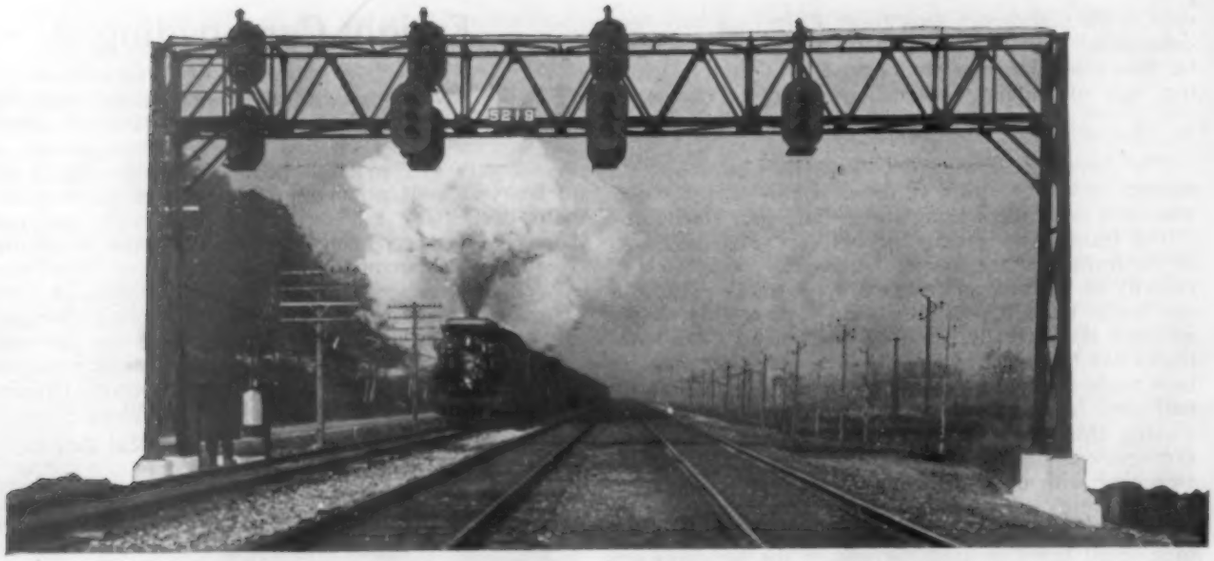
The freight car surplus for the period ended February 28 averaged 275,153 cars, including 141,589 box cars, 83,252 coal cars and 12,752 refrigerator cars.

Canadian Loadings

Revenue car loadings at stations in Canada for the week ended March 5 showed an increase of 2,216 cars over the previous week and 9,342 cars over 1926.

	Total for Canada			Cumulative Totals to Date	
Commodities	Mar. 5 1927	Feb. 26 1927	Mar. 6 1926	1927	1926
Grain and Grain products	8,114	7,348	5,863	76,158	67,034
Live stock	2,089	1,894	2,132	18,400	18,060
Coal	6,246	5,977	3,745	60,067	46,347
Coke	377	483	316	3,637	4,913
Lumber	3,416	3,170	3,348	26,433	27,568
Pulpwood	6,507	6,809	3,691	51,004	36,111
Pulp and paper	2,179	2,217	2,644	19,729	24,273
Other forest products	3,849	3,908	3,734	30,835	32,457
Ore	1,506	1,408	1,457	12,404	12,990
Merchandise, L. C. L.	16,898	16,147	15,616	140,707	129,901
Miscellaneous	11,883	11,487	11,086	99,170	95,531
Total cars loaded	63,064	60,848	53,632	538,544	495,185
Total cars received from connections	41,341	38,759	39,822	337,465	320,154

Express Car Built for the Chicago, Rock Island & Pacific by the American Car & Foundry Company—Length Over End Sills, 70 ft. 8¾ in.; Light Weight, 132,400 lb.



Eastbound Train Approaching Bridge 6 at N U-Cabin

C. & O. Signals Three-Track Line for Either Direction Operation

Heavy traffic facilitated by simplified color-light indications installed on 10-mile section of new layout, including five new interlockings

By B. T. Anderson
Superintendent of Signals, Chesapeake & Ohio

THE Chesapeake & Ohio has installed an interesting signal and interlocking installation on a 10-mile section of three-and four-track railroad between Russell, Ky., and Ashland, in connection with the rearrangements of tracks, yards and a new passenger station at Ashland. Formerly a double-track line handled all the freight and passenger traffic through the city of Ashland, but due to the congestion at the old station it was often necessary for freight trains to block some of the 20 street crossings in the city and seriously delay highway and railway traffic. This portion of the Chesapeake & Ohio is one of the busiest on the system as it handles not only the regular Cincinnati division traffic but also all the coal movement to the Columbus territory. A typical day's traffic includes 70 freight trains, 18 passenger trains, plus light engines, switch engines and extras. Three-position automatic semaphore signals had previously been used throughout the entire territory. The switches and crossovers at Russell, NC Cabin, and Clyffeside were hand operated, being protected by semaphore electric signals. A small mechanical plant was in service at AC&I crossing. Trains were moved against traffic by train orders, 150 such movements being made per month, with only the usual train order signal protection for such operation. The old semaphore automatic signals were spaced about 7,500 ft. apart. The use of such long blocks and hand-operated switches at Russell, West Ashland and Clyffeside with the movement of heavy traffic naturally caused delay to trains and did not provide the most flexible facilities for efficient train operation.

New Track Arrangement Equipped with Special Signaling

In 1924 a new track arrangement, as shown in the diagram, was placed in service, which provided two double-track layouts through the city of Ashland. Passenger traffic is now handled on the old double-track main line, while the freight trains operate over a new double-track freight line and yard built to the north along the Ohio river. This track and operating arrangement keeps the freight trains away from the busy section of town and the new passenger station. The new track begins just west of Pike Crossing, east of Ashland, with three running tracks. Westbound slow freight trains usually take Track 1 at Pike Crossing, Tracks 2 and 3 being reserved for high speed traffic. At Clyffeside the three tracks join two double-track lines, one for freight trains along the Ohio river and the other, the old main line, reserved for passenger traffic. At NC Cabin, west of Ashland, the two double-track lines again meet and become three tracks to Russell. From Russell, two main tracks are used to NS Cabin, about two miles away. Five interlocking plants are required to handle the signaling

on this layout to assist in performing the following movements:

1. Pike Crossing.....Street car and state highway crossing. Also controls switch leading into Track 1.
2. Clyffeside .....Three and four track junction.
3. A. C. & I. Crossing.....Crossing with old A. C. & I. line, now owned by the C. & O., and main passenger line.
4. NC Cabin.....Three and four track junction.
5. RU Cabin.....Three and two track junction. Also controls signals and switches to eastbound and westbound yards.

The entire signal installation comprised about 10 road miles, 29 track miles and 85 color-light signals, distributed as follows:

Details	Clyffeside	AC&I	NC	Russell	Automatics
Switches & Derails.....	17	2	14	14	
One Arm Signals.....	1	0	1	0	20
Two Arm Signals.....	12	2	12	8	8
Dwarf Signals.....	3	6	3	9	
Size Machine.....	31	12	31	43	
Type of Plant.....	EP	EM	EP	EP	

Trains Directed by Signal Indication Without Written Train Orders

With the installation of the new signal facilities all trains are operated between RU and NC cabins on any

View from Bridge No. 6, Looking East Toward N C-Cabin

of the three tracks in either direction by signal indication without train orders. The tracks are normally operated as follows: Track 1, westbound slow freight, Track 2, eastbound and westbound passenger trains, Track 3, eastbound slow freight.

East of NC Cabin the passenger trains operate in the normal direction of traffic over the two passenger main tracks and the freight trains operate with traffic on the double freight tracks along the river. On account of providing four tracks between NC and Clyffeside cabins, trains are not regularly operated against traffic between these cabins. If such movements are necessary, train orders and signals are used. In order to give some idea of the traffic since the new signals have been placed in service, a check at Russell recorded 88 engines crossing over from the west yard to the east yard and over 900 train movements at the plant in 24 hours.

The track arrangement described above was completed about a year before the new signaling was placed in operation. By making an actual comparison of the train sheets before and after the signals were placed in service, the improved operating conditions due to the signal system could be ascertained. There has been a unanimity of opinion among the signal and operating officers that the improved signal facilities have speeded up train operation, reduced the number of train orders, increased the safety of train operation, reduced the liability of accidents and provided an up-to-date signal system of the latest type at minimum expense for first cost as well as for cost of maintenance and operation.

The saving in time per freight train has averaged six

Interior of Electro-pneumatic Interlocking Cabin

minutes while considerable saving in time and safety of operation was increased by eliminating the hand operation of switches at RU, NC, and SX cabins. At RU Cabin before the interlocking plant was installed, engines crossing over from the westbound to the eastbound yard were sometimes delayed as much as 20 or 30 minutes,

Main Air Line and Cables Are Supported by Foundation to Facilitate Inspection

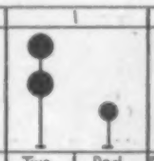
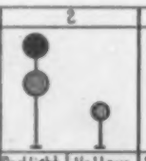
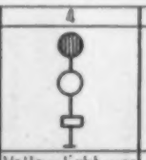
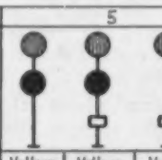
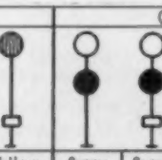
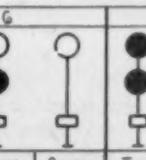
while getting over the crossover on hand signals in front of approaching trains. Foggy weather always slowed up train movements and increased the hazard of train operation. After the interlocking plant was placed in service it was estimated that at least five minutes were saved on each engine movement, and operation continued

in foggy weather as well as under better weather conditions.

Simplified Signal Aspects and Traffic Locking System Basis for Directing Trains

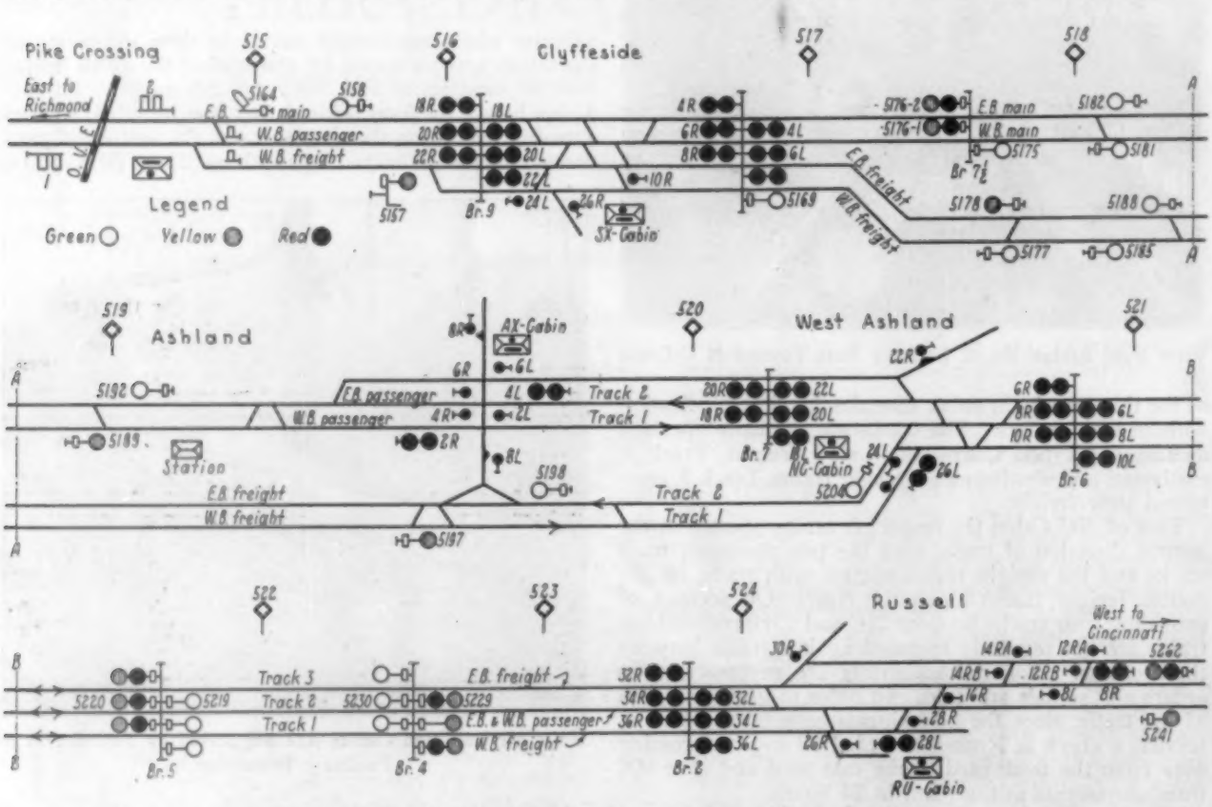
Seven signal aspects are given by the color-light signals in this installation, as shown in the accompanying chart. The signal indications are based upon the Standard Code of the A.R.A.; are few in number, easy to understand and have been of great help in assisting the trainmen to handle the largest traffic in the history of the railroad. The number of indications is less with the new system of signaling, even with its more extensive track layout, than with the old semaphore signaling previously in service. It will be noted from the chart that all interlocking signals are of the two-unit type except for the one-unit dwarf signals. Automatic signals are of the one or two-unit types, the two-unit type only being used for a distant indication when trains are diverted at one of the cabins over a high-speed turnout.

Several years ago the C. & O. developed an adequate traffic-locking system for directing train movements by signaling in either direction on single track, which was installed on about 75 miles of line. This early system employed a special hand-operated a-c. generator for supplying high voltage a-c. current for operating the traffic-locking apparatus. In the Russell-Ashland installation a similar scheme was developed except that 30 volt d-c, was used for traffic-lever operation. A circuit was designed which required two wires for a separate control and common for each of the three tracks which

Fig	1	2	3	4	5	6	7
Aspect							
Given by	Two red lights / Red light	Red light over yellow light / Yellow light	Red light over green light	Yellow light over green light and number plate	Yellow light over red light / Yellow light over red light and number plate / Yellow light	Green light over red light / Green light over red light and number plate / Green light	Two red lights and number plate / Red light
Name	Stop signal	Slow speed Signal	Clear restricting signal	Approach restricting signal	Approach signal	Clear signal	Stop and proceed signal
Indication	Stop	Proceed at slow speed prepared to stop	Proceed at restricted speed	Approach next signal at restricted speed	Approach next signal prepared to stop	Proceed	Stop then proceed
Rule	G01-A	G01-G	G01-F	S01-E	G01-B and S01-B	G01-C and S01-C	S01-AA

Legend:- Green ○ Yellow ◍ Red ●

Chart of Simplified Signal Aspects for Color-light Signals on C. & O.



Track and Signal Plan of Section from Pike Crossing to R U-Cabin

provided the following facilities: (1) An audible indication that an unlock was desired, (2) a visual indication that it was proper to reverse traffic, (3) a lock-up circuit to prevent reversing traffic except in the proper direction.

In August, 1926, a total of 210 trains were run against traffic on Track 2 between RU and NC cabins by signals without orders. Train orders would have been required for these movements if the traffic locking and signals had not been in service. In April, 1925, prior to the installation of the new signaling 182 train orders were issued for running six passenger trains between NC and RU cabins against traffic, trains being diverted 148 times in the month. This comparison shows over 40 per cent increase in the number of trains operated by traffic locking and signals without orders after proper facilities were installed. This scheme of operation has many advantages, such as safety, quickness and facility of operation, low first cost and freedom from failure as compared with some of the other schemes in more general use.

New Methods of Signal Construction

The underground runs were made with steel taped cable, not a foot of trunking being used on the entire installation. The main cable runs to the switches were supported in cable hangers attached to a ⅜-in. messenger wire bolted on the side of the air line foundations. At a point opposite each switch, the cable was dropped from the messenger line into the ground and then run underground to the switch layout. This method of construction is less expensive than installing conduits of fibre, concrete or wood and after several years service has proved very satisfactory.

Instead of running the two-inch air mains in the ground or in conduit, as is sometimes the practice, these lines were supported on concrete foundations. Suitable expansion joints are used in the main to provide for the expansion and contraction due to temperature changes. This type of construction is economical in first cost and provides means for the ready inspection of the main runs at all times.

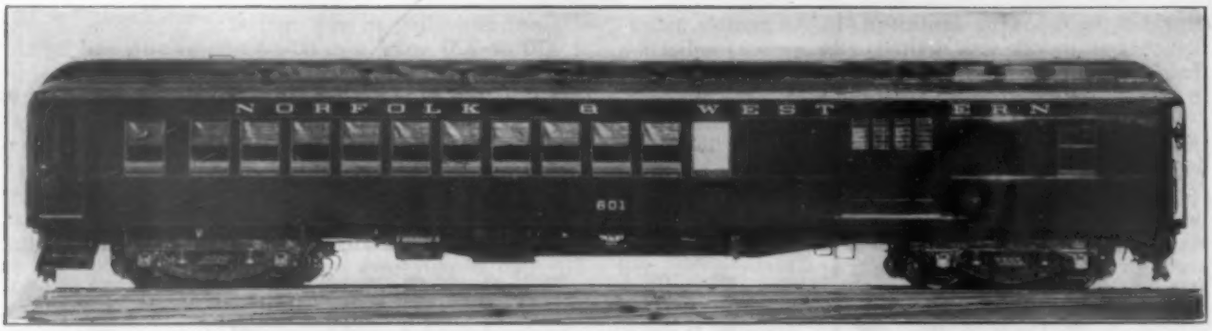
Aerial cables and wires are attached to a messenger wire, supported on the signal bridge structure. At each signal the wires leave the messenger support and drop off to the signal light unit. With this scheme of construction no iron or wood conduit of any type is used on the bridge and a very simple and economical layout is obtained, providing an easy method of inspection. Power at 110 or 220 volts, a-c. 60-cycle, was supplied by the local power company at Clyffeside and NC cabins, while at RU Cabin it was obtained from the division shops. At Clyffeside and NC cabins the 220-volt supply was used for operating duplicate sets of 12 cu. ft. air compressors, for supplying the tower and signal circuits and for feeding the 440 a-c. power line running east and west from each cabin. The air compressors are of 12 cu. ft. capacity and are operated by a 1.9 hp. three-phase motor. The two compressors operate alternately, being cut in service automatically when the air pressure drops below 45 lb. and cut out automatically at 60 lb. pressure. A compressor operates about once every three hours, indicating a very low leakage in the air lines and a small air consumption.

The number of circuits involved in three and four-track signaling made it necessary to run some aerial cable in addition to one ten-pin cross arm the entire length of the 10 miles installation. It was necessary to rebuild the Western Union pole line in this territory to permit of the heavier signal loading.

The track circuits on this installation are operated by five cells of primary battery, located in concrete battery boxes. Storage batteries supply the relay load normally but in emergency also carry the signal lights as long as the normal a-c. service is interrupted. The first power interruption occurred as the plants were being placed in service but due to the design of the power system trains were not delayed as d-c. power service is continuous.

The entire signal installation was designed and installed by the railway company forces, the cost of the work being approximately $300,000. The Russell-Ashland installation will always remain of interest due to the fact that on it was developed the first three-track either-direction color-light signaling, the first improved type of d-c. 30-volt traffic locking system, the first a-c. power system with storage battery and primary track reserve system and the first use of a simplified scheme of color-light signal indications, all of which have proved satisfactory in actual service. The power switches, color-light signals, and traffic locking and their maintenance and operation at Russell-Ashland have been so satisfactory that additional mileage of this type of signaling has been included in the signal budget for the coming years.

Japanese Government Railways Limited Train



One of Six Combination Passenger and Baggage Car Built for the Norfolk & Western by the Bethlehem Steel Company

Norfolk & Western Passenger Cars

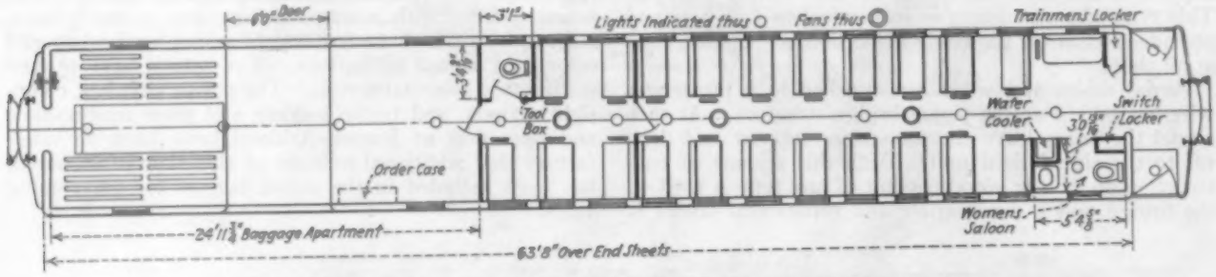
Forty-three purchased for branch line coach, baggage, express and mail service

THE Norfolk & Western has recently placed in service 43 passenger cars of all-steel construction which were built at the Harlan plant (Wilmington, Del.) of the Bethlehem Steel Company. Six of these cars are combination passenger and baggage cars, 18 are passenger coaches, some of which are arranged with a center smoking compartment, 15 are combination baggage and express cars and four are combination baggage and mail cars. All of these cars were purchased for use in branch line service. The height from the rail to the top of the roof in each case is 14 ft. 7/16 in. and the overall width is 10 ft. 3 in.

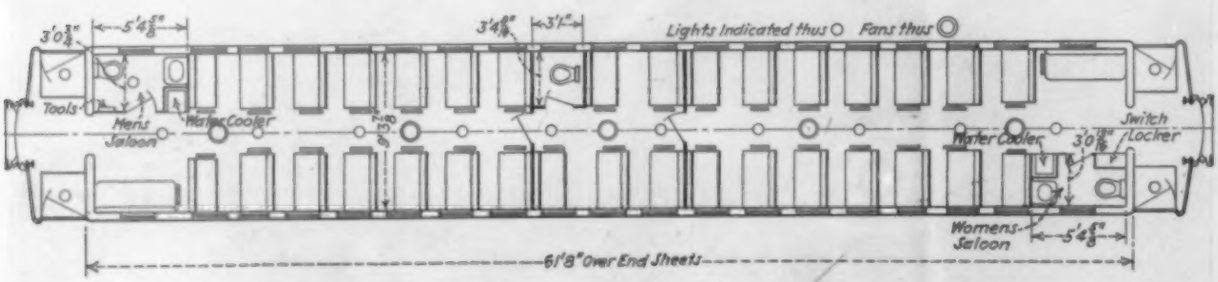
The baggage-express cars have a length over the buffers of 64 ft. 4¾ in. and an inside body length of 60 ft. ¾ in. The distance from center to center of the trucks is 42 ft. 10¼ in. and the total weight, complete, is 106,000 lb. These cars are equipped with the usual wall desk and letter case and also a safe, which is located directly under the desk.

The baggage-mail cars have approximately the same general dimensions as the baggage-express cars. The length of the mail compartment is 15 ft. 1 in., the remainder of the floor space being devoted to baggage space. The weight of these cars is 112,200 lb.

The interior arrangement of the combination passenger and baggage car, and a passenger coach having a smok-



Floor Plan Arrangement of the Combination Passenger and Baggage Cars



Floor Plan of the Coach with the Smoking Compartment in the Center

ing compartment in the middle are shown in the drawings. The combination passenger and baggage car has a seating capacity of 44, in a total floor length of about 33 ft. The men's toilet is located at the end of the passenger compartment next to the baggage compartment and occupies approximately the same space as that taken by the seat on the opposite side of the aisle from the entrance to the toilet.

As shown in the drawing, the coach is well equipped with facilities for the comfort of the passenger. The two toilets located at the ends of the car are provided with lavatories. A third toilet, located in the smoking compartment is equipped with a hopper only. The coaches with the smoking compartment, have a seating capacity of 70 persons, while those without the smoking compartment, have a seating capacity of 72. The seats in both cases are arranged in a total floor length of approximately 50 ft.

Standard Design Seats

The seats are of the Norfolk & Western standard reversible design. Those in the passenger compartment are upholstered in green frieze plush, while those in the smoking compartments are covered with pantasote. The cars are heated with the vapor system which is designed to maintain a uniform temperature under all weather conditions. The electric lights are arranged to provide ample and uniform lighting throughout the interior of the car.

The ventilating system is of special design, consisting of individual screen ventilators built in each window sash. These ventilators are so arranged that they may be operated by the passenger to give such ventilation as may be desired without annoying other passengers seated directly behind or ahead. In addition, these cars are also equipped with five ceiling fans arranged to distribute and circulate the air without creating a draft.

The exterior finish is the standard Norfolk & Western tuscan red with letters and numbers in gold. The interiors are finished in a light shade of Cuban mahogany except the ceiling, which is in ivory with each panel decorated with a sage green line.

The trucks are of the four-wheel type, equipped with 36-in. rolled-steel wheels with 5½-inch. by 10-in. journals. They are equipped with Simplex clasp brakes.

Minority Holders Oppose Cotton Belt "Merger"

WASHINGTON, D. C.

AT the recent argument before the Interstate Commerce Commission on the application of the Kansas City Southern for authority to acquire control of the Missouri-Kansas-Texas and of the latter for authority to acquire control of the St. Louis Southwestern, opposition to the plan was voiced by Walter E. Meyer, a director of the St. Louis Southwestern, who said he represented 6,700 shares of the common stock of the St. L.S.W., and 500 stockholders of the company who had elected him to the board.

Mr. Meyer declared that he thought that the granting of the applications is against the interest of the people served by the three railroads and the people of the country as a whole; also that "the methods and manners and undue exercise of control by these applicants renders the granting of these applications unjustifiable and if the commission by approving these applications shows that it approves of the acts of these applicants, I feel that the interests of security holders, of the holders of securities of this country as a whole, would be prejudiced thereby."

In reply to a statement by S. W. Moore, general counsel of the Kansas City Southern, that Mr. Meyer's purchases of stock after he had filed an intervening petition opposing the applications represented inconsistency, Mr. Meyer said: "I expect to be a stockholder in the St. Louis Southwestern long after the St. Louis Southwestern is freed from the domination of the Kansas City Southern. I bought 1,400 shares of stock after the applications were filed. The rest of the stock was bought by me because, as I stated in the record, I believed the stock was entitled to a dividend. I sent a letter to Mr. Upthegrove and the bankers so stating, and it was in connection with my belief that it was entitled to a dividend and my going on the board of the Cotton Belt, and my confidence in this company which is evidenced by my holding 3,300 shares of stock for six years, that this stock was bought; and entirely without regard to whether the Kansas City Southern was where it was or not." As to his reasons for opposing the application Mr. Meyer also said:

"I am opposed to this grouping because I do not think it is a logical grouping. No two lines of this group constitute any important route and channel of trade which will be preserved by the grouping.

"The traffic interchanges of these roads are comparatively insignificant as compared with their traffic interchanges with other roads. The traffic interchange of the St. Louis Southwestern and of the Southern Pacific is especially important, amounting to one and a half to two million dollars in net income a year, an amount equal not only to the earnings on the common stock, but also something on the preferred.

"I do not think that when the Congress enacted the Transportation Act, allowing roads to group with one another, that members had any idea of the state of facts presented to us here, that the Kansas City Southern owning 350,000 shares of the M-K-T and getting control of the St. Louis Southwestern by the preferred stock, would force 100,000 shares of M-K-T stock on the St. Louis Southwestern, and use these shares to get control of the M-K-T, and then turn around and sell the Cotton Belt, the instrument which had been used to get control of the M-K-T, to the M-K-T.

"The St. Louis Southwestern is a typical southwestern road. Ratio of operating expense is 76 per cent. The ratio of operating expense to gross earnings can be readily reduced to 70 per cent, and if that is done, the stock could earn easily $16 per share. That is the motive for my buying the stock."

On the L. & N. at Latonia, Ky.

Communications and Books

Safety Must Be a Habit

CHICAGO.

TO THE EDITOR:

Your very interesting editorials on the subject of safety afford food for thought in various directions. The safety problem touches a man's everyday life at a great many points. The average man has to engage in a constant struggle to sustain his life; it is surely logical that he should exercise every possible care to protect that life.

The safety-first campaign on the Burlington, as doubtless on all other railroads, has demonstrated that while it is important to make working conditions as safe as possible, the fact remains that while such efforts may reduce personal injuries five per cent, there remains 95 per cent that can be eliminated in no other way than by impressing individual employees with the necessity of working with the safety thought firmly fixed in the front section of the brain.

This is just as true in regard to the grade-crossing problem. The average motorist already knows the penalty of inattention or recklessness, but, unfortunately, there is altogether too much passive assent, not backed by effort. On the Burlington, much has been done to improve physical conditions at crossings, to improve whistling, and in getting the co-operation of newspapers and magazines. Much work has been done in schools and churches and before chambers of commerce and other civic bodies.

The magnitude of the problem is forcibly presented when you reflect that in exactly 27 per cent of crossing accidents on our line last year, the automobile ran into the side of engine or cars.

Notwithstanding the difficulties, the campaign on the Burlington, in the year 1926, resulted in a reduction of 33.7 per cent in the number of persons killed at crossings and 12.8 per cent in the number injured.

Train the Mind to Mind the Train.

F. B. THOMAS,
Safety Agent, Chicago, Burlington & Quincy.

The Ghost Train and the Twin Headlights

BROOKLINE, MASS.

TO THE EDITOR:

The letter in your issue of February 26, page 594, about the Air Line Limited, is of interest to many old railroaders in New England. Only recently I saw a reference in some paper to the twin headlights. Whether or not all of the stories are well-founded, is perhaps a question.

The "New England Limited" was placed in service on November 10, 1884, between Boston and New York. It ran over the New York & New England from Boston to Willimantic, Conn., and thence to New York over the New Haven. On March 16, 1891, this train was metamorphosed into the "White Train," or "Ghost Train," although the name "New England Limited" was still used.

Each road furnished a set of equipment, and the N. Y. & N. E. furnished a dining car between Boston and Willimantic. The cars were painted white and lettered and trimmed in gold. On its initial run, 'Gene Potter, the engineer, wore a white coat, and even the top layer of coal on the tank was covered with whitewash! Children were let out of schools and every one that could be out was near the tracks to see the train pass.

On May 22, 1892, the running time was reduced to five hours, 40 minutes; but was extended to six hours again on November 19, 1893. On October 20, 1895, this train was succeeded by the "Air Line Limited Express," as told by you. Inability to keep the white cars clean sealed their fate.

It was said that the twin headlights were used because the engine and train running over the tracks of the New Haven from Boston to Islington, 12 miles, needed a mark of distinction to prevent any mistake in identification while on that line. It was reported that Mr. Clark, president of the New Haven system at that time, saw this custom in England and brought it to this country, but this may or may not have been true.

When engines 128 and 129 were decided to be too light for the run, the twin headlights were removed. My theory has always been that these headlights were used either to mark this special fast train or else to notify all on the N. Y. & N. E. that these were New Haven engines; not to facilitate "seeing around curves."

The "Air Line Limited" continued to leave from the Park Square Station until September 10, 1899, when it left from the new South Station. On May 18, 1902, the train was discontinued and was succeeded by the present "Knickerbocker Limited," over the Shore Line.

CHARLES E. FISHER.

Faulty Hand-Motions

WASHINGTON, D. C.

TO THE EDITOR:

Your editorial note of March 12, calling for improvement in hand-motion signals, touches upon a very interesting question, one which many observers have thought about but have not known how to answer. You have barely touched it; so lightly that it is to be feared your suggestion will evaporate before it sets.

Handkerchiefs for making motions should be required to be used, not merely to be carried. It is necessary to use the white handkerchief habitually in order to cultivate the habit of mind which will insure the use of the red handkerchief when emergency requires it. This is illustrated by the experience of the Southern Railway of England where the wearing of red neckties was recently abolished because they were never used as stop-signals. A thing that is never used except in emergencies is likely never to be effectually used at all.

Hand-motion signals, as used in switching in freight yards, are open to the objection that they are standardized very imperfectly; a condition which now and then leads to a good deal of discussion concerning possible improvement in practices. The faults of the pictures as printed in the A. R. A. rule-book, plus the faults of careless brakemen, make a very unsatisfactory situation. The three principal motions—stop, proceed and back—answer very well, at night; but in many cases men who, in the day time, try to imitate, with the hand alone, the motions for which in the night they use a lantern, fail to come within a mile of precise compliance with the rule. (It is only the night motion signals that are described and illustrated in the book. For daylight operations each man is left to use his own imagination, or judgment—or caprice—as to just how to execute a motion.)

But, taking a superficial view, a fair degree of safety is preserved, and, therefore, in spite of various unstandard practices, the slipshod work continues year after year. If the day's work is completed with a fair degree of success, why should a fellow worry about book-rules, uniformity or anything else? As, however, the standard code as a whole continues to be looked upon in many quarters as an ideal, it would seem no more than right that everybody should sympathize constructively with those courageous advocates of uniformity and efficiency who believe in prescribing and carrying out a code of hand signals which shall be simple enough and logical enough to stand on its merits, and be a real element of strength in the operating organization; a code which can, with reasonable effort, be inculcated in the minds of a hundred or a thousand switchmen so that all will understand alike. (Inculcate: to teach or impress by repeated admonitions.)

To give these advocates a start, propound to your readers the following questions, with a special request for the attention

of any and all enginemen (and firemen) who work in yards or who do a good deal of switching anywhere:

1—What do you do when a hand motion is so indefinite that it cannot be called either "proceed" or "back"?

2—If, because of imperfect hand motions, you bump a car too hard and damage some freight, how do you fasten the blame on the brakeman?

3—Is your yardmaster a good teacher? Does he faithfully exercise his talent in this direction?

4—Does he suitably punish brakemen who let you bump a car because they are too lazy, dull or poorly trained to give signals which will enable you to estimate accurately the distance to be moved?

5—Can you improve on the A. R. A. hand motion (without lantern) for "stop"?

6—For "proceed"?

7—For "back"?

8—How can brakemen be educated to refrain from annoying repetitions of motions which do not need repeating?

9—Are there hand motion signals in use which ought to be forbidden because too ambiguous?

10—Can brakemen be taught in classes as is done with air-brake rules? What pictures should be used?

11—What questions would you suggest as more pertinent than the foregoing? S. F. B.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Green Rising, by Dr. William Bennett Bizzell. An historical survey of agrarianism with special attention to the organized efforts of farmers in this country to better their economic and social status, and the influence of these efforts on economic and social problems. To farm influence, for example, the author attributes the development of government regulation of railroads. 269 p. Pub. by Macmillan, N. Y. $2.

The Railways of Great Britain, by Lord Monkswell. "The general idea is . . . to present in intelligible form suitable for the lay reader a not too detailed account of most of the more prominent departments of railway activity in this country . . ." Preface, p. ix. Illustrations and profiles. 254 p. Pub. by Geoffrey Bles, London, Eng.

Periodical Articles

Eight-Mile Tunnel Through the Cascades and Great Northern Electrification, by William O. Shannon. An illustrated article on progress on tunnel and electrification. Stone & Webster Journal, March, 1927, p. 282-294.

Growth and Form in Modern Cities, by Frank Pick. Outlines the recent histories of Chicago, London and other large cities from the standpoint of increases in transportation demands and how they have been met by various forms of transportation. Journal of the Institute of Transport, February, 1927, p. 156-174.

The Problem of Railroad Consolidations. Pro and con arguments arranged in parallel columns. Congressional Digest, March, 1927, p. 1-20.

The Railways and the Panama Canal, by Franklin Snow. The influence of both on the growth of the West and a thoughtful consideration of questions of competition, rates, necessity for railways, and operating results of the canal. North American Review, March-April-May, 1927, p. 29-40.

Rebuilding the Industrial Cripple, by Dr. Victor G. Heiser. What is being done to train men and women for jobs other than those held before they were incapacitated by injury. North American Review, March-April-May, 1927, p. 84-90.

Union-Management Co-operation on the Canadian National Railways, by Joseph Corbett. American Federationist, March, 1927, p. 311-314.

Depreciation and Valuation for Rate Control, by James C. Bonbright. Columbia Law Review, February, 1927, p. 113-131.

Railroad Gross and Net Earnings for the Calendar Year 1926. What they are and what influences them. Commercial and Financial Chronicle, Feb. 26, 1927, p. 1116-1124.

Looking Backward

Fifty Years Ago

Bills to abolish the railroad commissions of Connecticut, Missouri, Minnesota and Illinois have all failed of passage in their respective legislatures.—*Railway Age*, March 22, 1877.

On Monday last a new tariff of freight rates between New York and the West went into effect. It is based on an advance of 50 per cent on the Chicago basis. This is a matter of necessity, for railways cannot continue to do business at the low rates of last season.—*Chicago Railway Review*, March 17, 1877.

The Atlantic & Great Western (now a part of the Erie), according to the annual report of the receiver for the year 1876, has a capital account of $218,000 per mile of road owned, $134,500 of which is funded debt. In order to have paid interest on its obligations during 1876 the railroad would have required a traffic fully as great as that of the Pennsylvania or six times as great as its actual traffic.—*Railroad Gazette*, March 16, 1877.

Twenty-Five Years Ago

At the present time not less than 7,984 miles of new railroad are already under contract or actually under construction, while there are in addition 3,790 miles on which it seems probable that work will be undertaken this spring or summer.—*Railway Age*, March 21, 1902.

The Canadian Pacific has placed an order in Germany for 20,000 tons of steel rails, 10,000 tons to be rolled by the Krupps' at Essen and 10,000 tons by the Bruchens'. The German market at present seems to be the most favorable and can undersell both the American and English mills.—*Railway and Engineering Review*, March 22, 1902.

After being operated for nine years without making any disbursements of profits to shareholders, the directors of the Missouri Pacific have placed the shares on a dividend basis of 5 per cent a year, and the record of operations for the fiscal year ending December 31 shows that the dividend balance for the year was virtually double the amount paid.—*Railroad Gazette*, March 21, 1902.

Ten Years Ago

The Hell Gate bridge of the New York Connecting Railroad, jointly owned by the Pennsylvania and the New Haven companies and which will constitute an all-rail line between New England and the South through New York, is now substantially completed, and on March 9 it was dedicated by Samuel Rea, president of the Pennsylvania. The railroad, six miles long, has cost over $27,000,000.—*Railway Age Gazette*, March 16, 1917.

In every year but two since the organization of the division of prosecution of the Interstate Commerce Commission in 1907 there have been more indictments of shippers and passengers for soliciting and receiving rebates or other preferential treatment, false billing of shipments, and violation of the anti-pass act, than of the railways. The total number of indictments for violations was less in 1916 than in any other year since 1910.—*Railway Age Gazette*, March 16, 1917.

The United States Circuit Court of Appeals rendered a decision at Salt Lake City, Utah, on March 10, in favor of the Southern Pacific Company in the action of the government to compel that company to divest itself of control of the Central Pacific railway. The decision states that there is no evidence to support the allegations that operation under the same management constitutes a violation of the Sherman law and the Pacific Railroad Act.—*Railway Review*, March 17, 1917.

Odds and Ends of Railroading

To Viola Slater, aged 2, goes the honor of being the first passenger through the Moffat tunnel. Little Viola was badly burned, near the west portal of the tunnel, and it was necessary to get her to the hospital as quickly as possible. The road over Berthoud Pass was impassable owing to the deep snow. So the youngster was bundled up and taken through the tunnel by one of the electrical trains ordinarily used in transporting the muck. A waiting automobile took her from the east portal to the hospital in the city, where she is reported to be getting along well.

Marriage on railway schedule is the most recent service rendered by the Illinois Central. A young man traveling from Goddard, Ala., to Corinth, Miss., informed the conductor that he was to be married at Corinth and that he would take the next Illinois Central train for his honeymoon if the wedding could be arranged in time. The conductor promptly wired ahead to the agent. When the train pulled into Corinth, the girl, the license and the minister were waiting on the platform. The ceremony was performed without delay, in plenty of time to catch the next train.

Railway service calls men to peculiar places sometimes. There are railway men working deep in the Alaskan mountains, and bridge tenders in the middle of Great Salt Lake and Lake Ponchartrain who seldom see land; but one of the most peculiar of all positions is that of George S. Salisbury. Salisbury is an employee of the Pennsylvania who, though living within sight of New York City, has scarcely seen a railroad track or locomotive in five years. He lives in the middle of New York harbor, with his wife and daughter and is "captain" of the "Scow Ox." On this scow, which serves as a distribution point to and from which barges loaded with coal and merchandise are towed to the piers in the harbor, he lives with his family in a four room cabin that boasts a radio, chicken coop and dog. For five years he has tied up to his scow some 40 craft a day. His daughter is carried to school in New York each morning on a Pennsylvania tugboat.

Some Railroad President!

How far into details should a railroad president go?

This story is told about George F. Baer, late president of the Reading.

Mr. Baer was sitting on the porch of his home at Reading one Sunday afternoon when a rustic carrying a satchel approached.

"Is this where the president of the Reading lives?" inquired the stranger.

"Yes," answered Mr. Baer, "this is where he lives."

"Are you Mr. Baer?"

"Yes, I'm Mr. Baer."

"Well, how much," asked the man with the satchel, "does an excursion ticket to Niagara Falls cost?"

"Sorry, but I do not know," replied the president.

"What!" exclaimed the astonished caller. "Don't know the price of a ticket to Niagara Falls! You are a hell of a railroad president."—*Philadelphia Inquirer.*

"Nowhere to Run At All"

A writer in the American Mercury, in discussing laws which affect the railroads, has this to say:

"The Missouri and Indiana legislators, however, really lead the procession with bills for harassing the railroads. In Missouri, I find bills (a) to amend the anti-free-pass law so as to allow the guide of a blind person to have a free ride, (b) to prescribe the number of doors to be opened at station stops, and (c) to prohibit a railroad from moving a terminal, once it has been established, for five years (I will vow there is the decay of a legislator's home town in this). In Indiana I find (a) 'A Bill to Be Entitled an Act to Empower and Permit the Driver of a School Bus to Delegate to the Children Riding in His Bus the Duty of Watching Out for Trains at Railroad Crossings,' (b) a bill to compel railroads to destroy weeds along the highways, (c) a bill to fine citizens for getting themselves carelessly bumped by a railroad train, and (d) a bill to prohibit locomotives from running backward. The legislators already try their level best to prohibit the railroads from running forward. What between forbidding them running forward and forbidding them running backward, the roads will soon have nowhere to run at all."

The "Seven O'Klockers"

When it comes to comparing distance and mileage traveled by the average tourist and globe trotter, says one of our correspondents, the record as established by the "Seven O'Klockers" puts them all in the shade. What may be termed one of the most rare and individual organizations in the world, known as the "Seven O'Klockers," has hung up a yearly record for a number of years. This organization is made up of 95 men who travel daily from Philadelphia to New York, and return, covering approximately 180 miles for the trip. The length of time that these commuters have been making this trip runs from 3 months to 22 years per person. A variety of interests are represented by this group: merchants, telephone companies, bankers, brokers, technical engineers, advertising, petroleum, railroads, lumber, manufacturers, wool, coal, shipping, dry goods, mining, newspapers and journalists.

Mileage per person per day	180
Mileage per person per year	51,840
Miles for 95 persons per day	17,100
Miles for 95 persons per year	4,924,800
Hours per person per day	4
Hours per person per year	1,152
Hours for 95 persons per day	380
Hours for 95 persons per year	9,440
Total number of years traveled of the 95 persons	569
Average number of years traveled per person	5.9
Average total number of hours per person	6,912
Average total mileage per person	311,040
Cost per person per month	$38.24
Cost per person per year	$458.88
Cost for 95 per month	$3,632.80
Cost for 95 per year	$43,593.60
Cost per person for 5.9 years	$2,667.39
Cost for 95 for 5.9 years	$53,402.24
Total hours longest commuter (22 years)	25,344
Total mileage longest commuter (22 years)	1,250,480
Total cost longest commuter (22 years)	$10,095.36

A Chief Engineer's Reverie

When I was just a callow youth,
Fresh from out of college,
I hired out on a railroad gang
For practical knowledge.

'Twas "Roddo" this and "Roddo" that,
"Gosh, 'Roddo,' but you're dumb,"
I carried that and carried this,
Until my arms were numb.

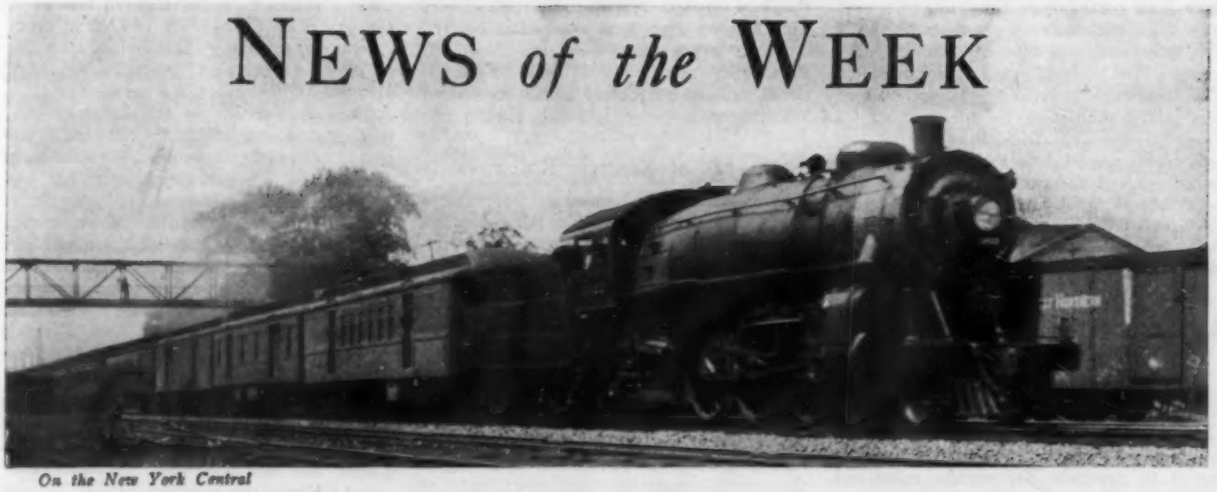
We built a line across the plains,
Down in the old I. T.,
We sweltered in the red-hot sun,
Gosh, how it blistered me.

We laid our heads on canvas beds,
And dodged the driving rain,
I'll bet I've pulled and yanked around
Ten thousand tons of chain.

An awful life it seems to me,
As memory takes me back,
And yet I'd surely like to be
A workin' on the track.

RODDO.

NEWS *of the* WEEK



On the New York Central

THE RAILWAY CLUB of Pittsburgh will hold its next meeting on March 24, 1927, at the Fort Pitt Hotel, Pittsburgh, Pa., when a paper will be read on "The Future Development of Locomotives and Cars Is Dependent on Steel," by F. J. Griffiths, chairman of the board of directors, Central Alloy Steel Corporation, Massillon, Ohio.

THE RAILWAY WOMEN'S BUSINESS ASSOCIATION OF BOSTON was organized, recently, at a dinner held in the rooms of the Young Women's Christian Association of that city. Over fifty women, representing different roads and affiliated interests, were present. The president is Miss Hazel S. Hoyt, of the passenger traffic department of the Boston & Maine.

A BILL providing that the governor of Colorado shall appoint the members of the Moffat Tunnel Commission, thus doing away with an election, and stipulating that the state shall not be liable for any debts or actions of the commission, has been passed by the Senate and House of Representatives of that state. The bill provides that the appointments must have the approval of the Senate.

EMPLOYEES OF THE Canadian National Express Company, numbering 2,500 persons from coast to coast, have served notice of a demand for higher wages. The average of the wage increase asked is about 20 per cent. The demand includes an equalization of wages paid different classes of employees, equalizing wages paid the same classes in different territories, and changes in the rate for overtime.

THE INTERSTATE COMMERCE COMMISSION, having under consideration the question of the character of construction of express refrigerator cars, has issued an order to the railroads which operate such cars; also to the American Railway Express Company and the Southeastern Express Company, directing them to file on or before April 30 data showing the character of construction, insulation and type of ice bunkers. The carriers also are directed to file thereafter each year similar reports in the form in which the commission secured similar information as to freight refrigerator cars.

Recapturing

The Interstate Commerce Commission has issued to the railroads its annual order directing them to report their net railway operating income and valuation for the year 1926, for the purpose of showing whether they have any recapturable "excess income," and directing them to remit to the commission one half of the excess above 6 per cent. The value of the property is to be computed "upon such basis as by the carriers is deemed equitable and in accord with the facts."

Pay-Cars Laid Up

The Boston & Albany is to pay its employees henceforth in checks instead of currency, and the running of the pay-car will be discontinued. Employees will be paid every week, as heretofore, the law of Massachusetts requiring this. The Boston & Maine adopted the plan of paying by checks last May and has found the arrangement entirely successful. It appears that in some of the New England states, payment by check is not recognized as lawful unless it is satisfactory to the employee, but apparently no trouble has been occasioned because of this. Many of the employees are receiving checks from one to three days earlier than they got their pay under the former arrangement. No pay-car is run anywhere on the Boston & Maine at present.

The Collision at Savannah, N. Y.

The New York State Public Service Commission, reporting on the rear collision of passenger trains on the New York Central at Savannah, N. Y., January 9, (heretofore reported on by the Interstate Commerce Commission; *Railway Age*, February 26, page 562) says that an overhead bridge between the distant and the home signal is in part responsible for obstructing the views of enginemen, and a change in the location of these signals is recommended.

In stating the causes of the collision the report mentions first the absence of an automatic train stop, which, "if it had been installed at this point and provided it operated as intended," would have prevented such a collision. Second, the failure of the flagman is named, and third the failure of the engineman. Engineman Scoville had a clear record prior to the night of the collision.

Frisco to Move Shops to Yale, Tenn.

The mechanical department facilities maintained by the St. Louis-San Francisco at Harvard, Tenn., and Memphis, are to be discontinued and re-established at Yale, Tenn., six miles southeast of Memphis, where $1,450,000 will be spent in enlargements and improvements. Preliminary work has already begun with the sinking of two 500-gal.-per-minute wells. During 1927 about $750,000 will be spent on the erection of power houses, a roundhouse, machine, boiler and blacksmith shops, a storehouse, two coal chutes, with electrically driven conveyors, a mill shop and several car yard buildings. The power house will have two 450-hp. boilers. It is expected that two years will be required to complete the work.

The car building program at Yale for 1927 includes the construction of 600 new coal cars, the conversion of 200 coal cars into flat cars, and the reinforcing and modernizing of 200 coal cars.

Proposed New Haven Pensions

The New York, New Haven & Hartford has proposed to its employees the formation of a "Co-operative Retirement Plan" under which, using contributions both from the company and from employees, a fund would be established to pay pensions. Nothing official has been given out concerning the proposal, but it is understood to be, at the present time, under consideration by employees who are requested to vote on its adoption. An annuity system supported by the employees and a pension system supported by the company are planned to be operated together. Employees will be, under the regulations, entitled to benefits after they

have been contributors for five years, and retirement allowances are to become available to an employee after 10 years of service, provided he is 65 years of age or older. The total pension is to be 1½ per cent of the salary multiplied by the number of years of service. Disability benefits are also to be provided for. Employees' contributions will be based on their age. Members' contributions are to provide five-twelfths of the retirement allowance, two-fifths of the disability allowance and one-third of the administrative expenses.

I. C. C. Asked to Require Cab Curtains

The Railroad Commission of Wisconsin has filed a complaint with the Interstate Commerce Commission, naming most of the railroads of the country as defendants, asking it to prescribe appropriate rules and regulations, under the boiler inspection act, to provide for the equipment of locomotives and tenders used in Wisconsin and other states subject to similar climatic conditions, with suitable cab curtains, as prescribed in the Wisconsin statutes which were annulled by a recent decision of the Supreme Court of the United States on the ground that the Interstate Commerce Commission has complete jurisdiction in the premises. Or, the commission is asked to require "other devices adequate to protect the employees from inclement weather and enable said employees to operate said locomotives and tenders in the active service of such carriers in moving traffic without unnecessary peril to life and limb," as provided by Section 2 of the boiler inspection act. An order is also asked commanding the railroads to cease and desist from "violation" of the boiler inspection act.

I. C. C. Asked to Order New Construction in Idaho

The Lewiston (Idaho) Commercial Club has filed a complaint with the Interstate Commerce Commission, naming as defendants the Northern Pacific, the Oregon-Washington, the Oregon Short Line, the Camas Prairie, and the Union Pacific railroads, asking the commission to order an extension of the line of the Oregon Short Line from Homestead, Ore., through Clarkston to Lewiston, Idaho, and common user of the line operated by the Camas Prairie from Lewiston to Riparia; also, such other common user as the commission may deem to be requisite and proper. This line, the complaint says, would furnish a water grade line from Huntington, Ore., and all points east to Portland, Ore., and all points north and west. The commission is also asked to require defendants to "disclose what, if any, agreements they have in restraint of construction in central Idaho and eastern Washington."

It is alleged that the Oregon Short Line prior to 1896 approved the construction of a line from Homestead to Clarkston and Lewiston, and that the Northern Pacific then threatened to enter the territory served by the Oregon Short Line by constructing a line from Missoula, Mont., through the Lolo Pass to Lewiston and Portland; that thereupon the Oregon Short Line and its associated companies entered into an arrangement with the Northern Pacific that neither would build any additional railway in central Idaho or eastern Washington.

Status of Electric Railways

The Interstate Commerce Commission has issued a decision in Ex Parte No. 38, holding that its order of December 14, 1925, approving rules and instructions for the inspection and testing locomotives propelled by power other than steam power, applies to (a) electric railways which are subject to the interstate commerce act and which are not street, suburban, or interurban railways, and (b) street, suburban, and interurban electric railways operated as parts of general railroad systems of transportation. The commission also holds that the locomotive inspection act, as amended, applies to any locomotive used or permitted to be used on the lines of any carrier subject thereto. The proceeding was instituted pursuant to a petition of the American Electric Railway Association, which requested an opportunity to show that its members are not subject to the order, and the majority of its members contended that they are interurban electric railways. The report gives a list of 35 railways which are found to be subject to the act, a list of 20 that are found not to be so subject, another list of 46 lines having no locomotives, and another list of 16 as to which insufficient evidence was available to determine their status.

Railway Earnings for January

Class I railroads in January had a net railway operating income of $61,578,697, equal to an annual rate of return of 4.20 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In 1926, the total was $65,761,272, or 4.59 per cent.

Operating revenues for the month amounted to $487,004,335, as compared with $481,418,187 in January, 1926, or an increase of 1.2 per cent; operating expenses totaled $387,489,361, compared with $378,933,304, or an increase of 2.3 per cent, and taxes were $29,338,230, an increase of 2.4 per cent.

Thirty-eight Class I railroads operated at a loss in January, of which 15 were in the Eastern, three in the Southern and 20 in the Western district.

Net railway operating income, by districts, in January, with the percentage of return based on property investment on an annual basis, was as follows:

		Percent
New England Region	$2,158,961	4.91
Great Lakes Region	9,570,682	4.04
Central Eastern Region	12,649,610	4.46
Pocahontas Region	6,265,620	8.04
Total Eastern District	30,644,873	4.77
Total Southern District	9,851,105	4.27
Northwestern Region	1,517,108	0.91
Central Western Region	12,390,609	4.67
Southwestern Region	7,175,002	4.46
Total Western District	21,082,719	3.56
United States	61,578,697	4.20

The rate of return on property investment for the five years ended with the month of January, has averaged 4.52 per cent.

The net railway operating income of the Class I railroads in the Eastern district in January was $30,644,873 (4.77 per cent) Operating revenues, $246,780,367, an increase of 4.5 per cent; operating expenses, $198,844,239 (increase, 4.5 per cent).

Class I railroads in the Southern district had a net of $9,851,105 (4.27 per cent). Operating revenues, $68,035,630, a decrease of 8.8 per cent; operating expenses, $53,258,427 (decrease, 3.7 per cent).

Class I railroads in the Western district had a net of $21,082,719 (3.56 per cent). Operating revenues, $172,188,338, an increase of nine-tenths of one per cent; operating expenses, $135,386,695 (increase, 1.6 per cent).

Equalization of Rates Case

Strenuous efforts are being made by the Dominion Railway Board to conclude the general equalization of rates case before Easter and late last week, following conference with the various counsel, it was decided to have all evidence before the board this week.

E. R. Mallory, director of the Bureau of Statistics in the C. N. R. system, stated that the operating revenue of the railway in 1925 was $208,718,883, and in 1926, $226,547,815, an increase of $17,828,931, or 8.32 per cent. The operating expenses were $184,372,201 in 1925, and $190,172,271 in 1926, an increase of $5,800,069, or 3.15 per cent. The net operating revenue in 1925 was $22,845,719, and last year $35,374,581, an increase of $11,528,861, or a gain of 48.35 per cent.

The amount of fixed charges due to the public in 1926 is $39,197,233, and to the Government $32,090,453, so that the net earnings will be more than adequate to pay all fixed charges due the public and leave more than $2,000,000 of a credit balance, it was stated.

J. R. L. Starr, representing the interests of Ontario before the hearing on the equalization case, protested against the assumption of Western counsel that Western Canada originated the bulk of freight traffic and revenue.

Ontario Improvements

General Superintendent H. C. Grout, of the Canadian Pacific Railway's Ontario district, has announced from Toronto plans for various improvements in Ontario.

The plans call for additional sidetracks at Sulphide, Belleville, Oshawa, Guelph Junction, Chatham, Tilbury, St. Joachim, Windsor, McNaught and Walton. These tracks will increase siding accommodation, provide second passing tracks, and facilitate switching, and have been recommended for the reason that they would facilitate train operation and enable the company to better handle increased business.

New track scales at Woodstock and London will replace smaller scales. A new turntable at Windsor will enable the company to use heavier power there to the same end.

Eighteen miles of automatic signals between Streetsville Junction and Guelph Junction will afford continuous automatic block signal territory from Toronto to Woodstock.

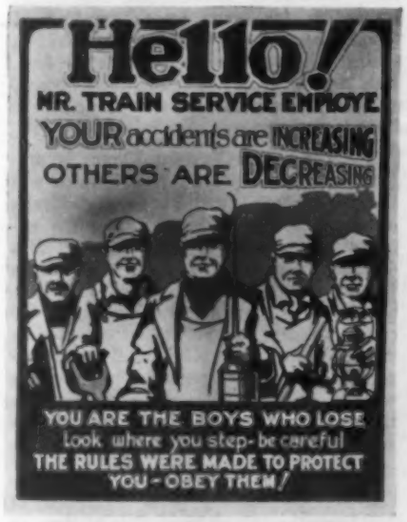
New water tanks are to be erected at Crow Lake and Blyth, a new 50-ton coaling plant at Goderich, and new engine houses at Peterborough, Orangeville and Guelph Junction, which with the development to the engine house at Port McNicoll

will enable heavier power to be maintained there.

The laying of 40 miles of 100 pound rail on the MacTier subdivision will improve the riding condition of the track and release the balance of the 80 pound rail. Sixty-five miles of ballasting will be undertaken at various locations.

Safety Program for April

L. G. Bentley, chairman of the committee on education, Safety Section, A. R. A., has issued circular No. 144, containing the views of his committee on the most important questions to be considered in April under the general scheme of assigning a specific safety subject to each month. These views, set forth under five heads, corresponding to five classes in the I. C. C. statistics of casualties to employees, are consolidated into a single point, *Injuries to Train Service Employees;* for these employees, in the ten months ended with October, showed an increase in the accident record, whereas all other employees (as a whole) show a decrease; and the appeal of the committee is set forth in the placard which is here illustrated on a small scale. For the ten months, killed and injured train-service employees numbered 26,263, as compared with 24,911 in the preceding year; whereas the record for all other employees is 68,069, as compared with 75,994 in the first ten months of 1925. Thus we have in one case an increase of 1,352 and the other a decrease of 7,925. Under the head of "getting on or off locomotives or cars," there was an increase of more than eight per cent, and "struck or runover by locomotives or cars" shows an increase of 15 per cent.


Hello!
MR. TRAIN SERVICE EMPLOYE
YOUR accidents are INCREASING
OTHERS ARE DECREASING
YOU ARE THE BOYS WHO LOSE
Look where you step-be careful
THE RULES WERE MADE TO PROTECT
YOU - OBEY THEM!

Short Lines Oppose K. C. S. Suggestion

The American Short Line Railroad Association has filed a memorandum with the Interstate Commerce Commission in connection with the application of the Kansas City Southern for authority to acquire control of the M.-K.-T., and of the latter to acquire control of the St. Louis Southwestern, saying that it has reached the conclusion that the procedure suggested by S. W. Moore, general counsel of the K. C. S., with respect to the treatment of short lines that have intervened in the case, on the ground that the proposed "merger" would injure them unless they are included, is "without merit." Mr. Moore proposed that the commission approve the applications and reserve jurisdiction as to the short lines, with a view to later decision that they ought to be included if they should then show evidence that they had been prejudiced.

"The adoption of the procedure proposed," said the memorandum by Ben B. Cain, general counsel of the association, "would be to gamble with the rights of the public and the rights of the carriers that are now before this commission asking for protection. Time would probably prove the commission had made a bad bargain. I respectfully submit that there is no justification for requiring the short and weak lines and the public interest directly involved in their continued operation to be thus imperiled." Mr. Cain submitted a form of order which he thought would be appropriate to protect the interests of the short lines.

Canadian Government and Railway Board

From the decisions given late last week by the Federal Cabinet at Ottawa it appears that the Canadian Government has at last decided to leave alone the Dominion Railway Board and recognize its supremacy in the matters over which it has jurisdiction. In many cases where the Government has interfered to give certain instructions to the Board it has been because of interference instituted by the Parliament of Canada in which are legislators for the special and sectional needs of certain parts of the Dominion.

Last week the Cabinet, or Privy Council, gave decision on two appeals to it from decisions of the Railway Board.

In the appeal of the provincial governments of Saskatchewan and Alberta asking that the Railway Commission should be compelled at once to render decision on the application for the enforcement of the Crow's Nest Pass rates in these two provinces, the Cabinet has declined to take action. The Cabinet's decision in this case is to instruct the Railway Commission to deal with the application as quickly as possible.

In the appeal of the British Columbia Government, in which the Cabinet was asked to reverse a decision of the Railway Commission refusing to give to the province the right to prosecute President E. W. Beatty and other directors of the C. P. R. company for alleged non-compliance with an order of the commission. The decision of the Cabinet is to dismiss the appeal.

As to the British Columbia decision, it relates to a controversy which commenced in September, 1925, when the Railway Commission issued an order instructing the railways to put in Crow's Nest Pass rates on grain and flour westbound from the prairies to the Pacific coast. In carrying out this order the railways, it is alleged, put in Crow rates from Edmonton to Vancouver and then charged the same rate from Calgary to Vancouver, although the distance via Calgary is more than 100 miles shorter than the northerly route.

The British Columbia Government declared the Calgary-Vancouver rate not to be in compliance with the order of the commission and requested a further order of compulsion. This was refused and the province thereupon applied for permission to prosecute the directors of the Canadian Pacific Railway for non-compliance with the order. This was refused, also, and the province appealed to the Governor-in-Council.

Canadian Pacific Wage Increase Refusal

A lengthy statement giving the reasons for the refusal of the Canadian Pacific Railway of the increases in wages asked for by its clerks, freight handlers, station and store men was issued by the company in Montreal.

The statement noted the fact that existing rates of pay for railway employees of all classes became established as a result of conditions which developed during and subsequent to the war, and that the classes of employees now before the board received advances in their rate of pay at a ratio in excess of many other general classifications of railway employees, if not, indeed, of them all.

Since the existing rates of pay were established, the cost of living has remained practically stationary with slight seasonal variations one way or the other, while the company has suffered substantial reductions in the rates they were permitted to charge the public for handling of passenger and freight traffic.

Although increases in freight and passenger rates were granted the company at the same time, the increased revenue thus secured fell far short of meeting the increased expenditure.

Increases in pay and betterment in working conditions followed the precedent set in the United States during and after the war and likewise certain decreases in rates of pay were applied in 1921 and 1922, although the decreases made effective in the latter year were by agreement largely restored within two or three months. There have not been any changes since to justify any increase in rates of pay at this time.

Meanwhile reductions in freight and passenger rates had begun to come into effect and continued to such an extent that towards the end of 1922 freight rates in Canada had been decreased to the extent of 26.6 per cent as compared with a general reduction of 10 per cent on the United States railroads.

In a statement showing comparisons of rates of pay for clerks, freight handlers and station employees, the company shows that the present rates of pay as compared with those in force in 1914 have increased on the average approximately 110 per cent and as much as 150 to 160 per cent and even as high as 182 per cent, while the cost of living figures, based on family budget figures published by the Dominion Government Department of Labor, have during that time increased only 49.3 per cent. In comparison with the peak wage rates of 1920, which were generally accepted as being satisfactory at that time, the rates of pay for the greater number of employees have not decreased beyond 10 to 12 per cent, while cost of living during the same period decreased 21.4 per cent.

Foreign

A Head-on Collision in England

An accident unusual in Great Britain, i. e., a head-on collision, occurred between two passenger trains on the London-North Eastern, on February 14, near Paragon station, Hull, resulting in death to 10 persons and injuries to many more. One of the trains involved had just left Paragon station on the outward trip and the other, bound from Withernsea to Hull, was nearing the end of its journey.

The accident did not occur on single track and how the two opposing trains happened to be on the same track is so far unexplained. The Ministry of Transport is conducting an investigation into the accident and will as usual make public its findings.

Wide World

The Hull Collision

Big Crops Aid South African Roads

The report of the general manager of the South African Railways and Harbors for the financial year ended March 31, 1926, shows that the year was a record one in the history of South African Railways. On April 1, 1925, there existed an accumulated deficit of £5,185 with respect to the operation of railways and harbors. This debt was rapidly liquidated and by the end of the financial year there was surplus balance on hand due to the increased amount of traffic resulting from bumper crops, amounting to £764,506. Heavy rains preceding the 1925 maize crop brought a record harvest in nearly all classes of crops and improved pasturage in live stock, leading to an increased output in dairying products. These factors, together with the increased prosperity of the mining industries during the year, are held responsible for the heavy railway traffic.

The report of the general manager carried out comparisons between the year 1909 and 1925-26. Since the year 1909 the railway system of South Africa has increased by 5,108 miles. With the exception of 1,352 miles taken over in South-West Africa, this grand total has been constructed or acquired in various parts of the country, and today the total mileage operated by the department exceeds 12,000, while a further 429 miles of privately-owned railways are operated by the administration at the request of the owners.

Revenue during the last financial year reached the sum of £24,151,407, representing an increase of 131% over the revenue of 1909. Operating expenses increased over the same period by 230%, to a total of £18,735,324, which heavy increase finds explanation in the improved conditions of service and rates of pay now enjoyed by the employees, to the opening of many new lines for the benefit of the agricultural community, and to better provision for depreciation and reduction of interest-bearing capital. The total capital cost of railways as of March 31, 1926, was £126,029,725, representing a capital cost per mile of £10,379, a cost which compares favorably with that of railways in other countries, taking into consideration the heavy type of track used in South Africa.

In the year 1909 the number of passengers carried by the South African Railways was 28,191,135; last year's figures were 76,282,587. Freight traffic registered a rise during the same period from 10,268,074 tons to 25,233,094 tons. The number of employees had grown, by March 31, 1926, from 39,564 to 82,503, and a year's train mileage had exhibited the sizeable increase from 19,662,444 to 44,329,230

Traffic

"Liquid asphalt roof compound" was the description of two hundred half-barrels seized by the authorities in a freight car at Gloucester, N. J., on March 14; but which really contained liquid, classed as beer, which the police emptied into a sewer.

The Southeast Shippers Advisory Board met in regular session at Atlanta, Ga., on March 11, with an attendance of nearly 600. The committees' estimates of prospective business for the next three months were very favorable, notwithstanding some depression incident to agricultural losses. The next meeting is to be held at Mobile, Ala., on June 10.

Under the provisions of the Newton bill, which became a law on March 4, the Interstate Commerce Commission has begun suspending for seven months, instead of for 120 days, all proposed new freight rates against which convincing protests are filed, with a possible resuspension for 30 days, as under Section 15, paragraph 7, of the Interstate Commerce Act.

The Chicago & Eastern Illinois is preparing a "better poultry train" which will feature a coach fitted up as a children's play car, where mothers visiting the exhibits may leave their children. This demonstration train will be operated in Illinois from April 4 to April 15. It is scheduled to stop at 33 towns, and will consist of cars of exhibits on the production of better poultry. It will be accompanied by poultry specialists representing various public institutions and organizations, who will give lectures and demonstrations.

A committee, organized at the suggestion of Commissioner J. B. Campbell, of the Interstate Commerce Commission, to formulate a plan for the settlement of the discriminations which have followed the Watertown-Fargo rate decisions, has passed a resolution (at a meeting at Minneapolis, Minn., on March 8) calling on the federal board to step aside and empower the Minnesota Railroad & Warehouse Commission to conduct hearings and formulate a settlement of the entire matter. A second resolution was approved, calling upon the state legislature to adopt an amendment to the Cashman act which would give the Railroad and Warehouse Commission power to remove discriminations in intrastate rates.

Candy Shipped in Carload Lots

A total of 32 solid trainloads of candy will be shipped within 60 days by the Curtiss Candy Company, Chicago. Three trainloads already have left Chicago, the first going to California, the second to the Pacific Northwest, and the third to New York. Others will follow every few days to all parts of the country until the 32 shipments are completed. The three shipments that have been moved consisted of over 8,000,000 "bars" of "Baby Ruth" and other styles.

Cottonseed Rates to Be Investigated

The Interstate Commerce Commission has instituted Part 8 of its general rate structure investigation, No. 17,000, covering rates on cottonseed, its products and related articles, and has assigned it for hearing with some 23 formal proceedings now pending before the commission which bring in issue the rates on such commodities. The investigation will cover the rates from and to all points of origin and destination.

Mississippi Commission Wants Separate Mississippi Valley Rate Group

The Mississippi Railroad Commission has petitioned the Interstate Commerce Commission for a re-opening and rehearing of Ex Parte 74, the case in which the commission authorized advances in freight rates in 1920, for the purpose of determining the propriety of re-districting Southern Territory by separating what is known as "Mississippi Valley Territory" from other Southern territory for rate-making purposes.

"To continue Mississippi Valley in the general Southern rate group," the petition says, "and the revision of rates, particularly commodity rates, to make the Mississippi Valley rates conform to the general rate structure, will doubtless necessitate radical increases in the valley rates, producing enormous increases in revenues for which the carriers serving Mississippi Valley have and can show no need, and which transportation burden will fall in large measure upon the consumers and industries of Mississippi."

Bills of Lading of Shipments to Non-Adjacent Foreign Countries

The Supreme Court of the United States holds that Congress in the Interstate Commerce Act has entered upon the regulation of bills of lading of shipments over an interstate inland route to a seaport for delivery to a foreign vessel for ocean carriage to a non-adjacent foreign country.

On cotton from Earle, Ark., to Liverpool, England, via Brunswick, Ga., the bill of lading provided that no inland carrier should be liable for loss by fire. The cotton was burned at the compress at Earle, by a fire not set by the railroad. The Arkansas statute, Secs. 843, 844, declares such agreements abrogating liability void. The Arkansas Supreme Court (168 Ark. 22) applied the state statute, and gave judgment for the shippers, holding that the Acts of Congress regulating bills of lading apply only to interstate commerce and to shipments to an adjacent foreign country, and do not evince an intention to regulate bills of lading for shipments from a point in the United States to non-adjacent foreign countries. That judgment is reversed.—Mo. Pac. v. Porter. Opinion by Mr. Justice Butler. Decided February 21, 1927.

Equipment and Supplies

Locomotives

THE CENTRAL OF NEW JERSEY is inquiring for 5 Pacific type locomotives and 10 eight-wheel switching locomotives.

THE OLIVER IRON MINING COMPANY has ordered 10 heavy eight-wheel switching locomotives from the Lima Locomotive Works. Inquiry for from 8 to 12 locomotives was reported in the *Railway Age* of January 15.

THE TEXAS & PACIFIC has ordered 15, 2-10-4 type locomotives from the Lima Locomotive Works and 5 eight-wheel switching locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of March 12.

Freight Cars

GRAND TRUNK WESTERN.—See Canadian National.

THE PERE MARQUETTE is inquiring for 20 air dump cars.

THE CORNWALL is in the market for 15 hopper cars of 75 tons' capacity.

THE BALTIMORE & OHIO is inquiring for 500 gondola car bodies of 50 tons' capacity.

THE ST. LOUIS SOUTHWESTERN is inquiring for 30 steel underframes for caboose cars.

THE INTERNATIONAL HARVESTER COMPANY is inquiring for 30 quadruple side dump cars.

THE DENVER & RIO GRANDE WESTERN is inquiring for 300 automobile cars of 40 tons' capacity.

THE UNITED FRUIT COMPANY has ordered 10 air dump cars from the Magor Car Corporation.

THE WHEELING STEEL CORPORATION, Wheeling, W. Va., has ordered 4 air dump cars from the Magor Car Corporation.

THE NORTHERN PACIFIC has ordered 200 ballast cars from the Rodger Ballast Car Company. Inquiry for this equipment was reported in the *Railway Age* of January 29.

THE MISSOURI PACIFIC is now inquiring for 300 box cars. In the *Railway Age* of March 12 it was reported that this company expected to enter the market for this equipment.

THE CANADIAN NATIONAL has placed an order for underframes for 20 caboose cars for Grand Trunk Western service. The railroad will build this equipment at its Port Huron shops.

THE GREAT NORTHERN is inquiring for 500 steel underframes. This company has ordered 6 trunnion type air dump cars from the Pressed Steel Car Company to be built by it in the shopes at its Koppel car works.

THE NORFOLK & WESTERN has given a contract to the Ralston Steel Car Company, Columbus, Ohio, for rebuilding 1,000 hopper cars of 57½ tons' capacity. In the *Railway Age* of March 5, it was reported that the Norfolk & Western was asking for prices on repairing and remodeling 1,000 hopper cars.

Passenger Cars

THE CENTRAL OF NEW JERSEY is inquiring for 25 coaches.

THE SOUTH AFRICAN RAILWAYS will receive bids until April 14 at Johannesburg, South Africa, for 25 first-class articulated passenger cars.

THE NEW YORK CENTRAL has purchased the following gas-electric rail motor cars for use on the New York Central Railroad: J. G. Brill Company, 8; Osgood-Bradley Car Company, 3; American Car & Foundry Company, 2; and Standard Steel Car Company, 2. Inquiry for 19 gas-electric cars was reported in the *Railway Age* of January 22.

Machinery and Tools

THE CHICAGO & EASTERN ILLINOIS is inquiring for one 500-ton hydraulic double-end wheel press.

THE LOUISVILLE & NASHVILLE has ordered a 42-in. boring mill from the Niles-Bement-Pond Company.

THE TEMISKAMING & NORTHERN ONTARIO has ordered a 48-in., 400-ton wheel press from the Niles-Bement-Pond Company.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered a 5-ft. radial drill, a 6-ft. radial drill, and a 20-in. drill from Joseph T. Ryerson & Son, Inc.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one side rod boring and facing machine, one 20-in. shaper, one 26-in. by 10-ft. lathe, one 54-in. tire turning lathe, one 6-in. hack saw, one 16-in. heavy duty slotter, one car wheel grinding machine, one 6-ft. radial drill, one heavy duty coach wheel tire turning lathe, one automatic rip and cross cut circular saw, one car wheel journal turning machine, one radius link grinder, one heavy duty piston rod grinding machine, one 20-in. drill press, four 24-in. emery wheel grinders, one 4-ft. radial drill and one 1,500-lb., single frame steam hammer.

Supply Trade

The Mahr Manufacturing Company, Minneapolis, Minn., has removed its New York office to 55 West Forty-second street, New York City.

The Ramapo Ajax Corporation has opened an office at Los Angeles, Cal., in charge of **W. P. Janicki,** formerly of the engineering department at Chicago.

George F. Konold, Jr., secretary of the **Warren Tool & Forge Company,** Warren, Ohio, has been elected president to succeed James D. Robertson, deceased.

The New York Air Brake Company will remove its New York office, on April 1, from 165 Broadway to the Graybar building, 420 Lexigton avenue, New York City.

M. H. Oakes, formerly representative of the National Refining Company, with headquarters at Chicago, has been elected vice-president of the Charles R. Long, Jr., Company, the Okadee Company and the Viloco Railway Equipment Company.

Gordon Stoner, secretary of the **Midland Steel Products Company,** Cleveland, Ohio, and manager of its Detroit plant, has been elected vice-president, with headquarters at Detroit, and will be succeeded by **H. F. Kulas. S. C. Conrad,** assistant treasurer of the Otis Steel Company, has been promoted to treasurer, and will be succeeded by **G. A. Paine.** These appointments follow the resignation of **L. Kemper** as treasurer of the Otis Steel Company and vice-president and treasurer of the Midland Steel Products Company.

Micarta Fabricators, Inc., New York, has taken over the entire business and personnel of the **Accurate Gear Corporation** of Brooklyn, N. Y., and created a new division of the general sales and engineering departments known as the Accurate Gear division. **Joseph J. Braun** has been appointed chief engineer of the company and general manager of the Accurate Gear division. The plant of the Accurate Gear corporation has been moved to 307 Canal street, New York, where the combined companies will have their general offices and plant.

Maurice L. Sindeband has been elected a vice-president of the **American Brown Boveri Electric Corporation,** with headquarters at New York and assumed his duties on March 1. Since 1915, he has been in the engineering department of the American Gas & Electric Company and he was recently elected a vice-president of this company in charge of the electrical engineering department. After receiving his education at Columbia University, Mr. Sindeband started his engineering career in 1907 with the New York Central. He was then engaged in station design work for the Brooklyn Edison Company, and in 1915 he entered the engineering department of the American Gas & Electric Company. His rise here was rapid, and he was made electrical engineer in 1918, and later vice-president.

Ernest L. Estes, railway salesman for **E. I. duPont de Nemours & Co.,** chemical products division at Parlin, N. J., has been appointed district manager railway sales, with headquarters at St. Paul, Minn. Mr. Estes was born on December 14 1887, at Kansas City, Kan. After completing his education in the schools of Kansas City, he entered railway service on the Kansas City Southern in September, 1904, as clerk in the local freight office at Kansas City, Mo., and served with that company continuously until May, 1923, in the general office as clerk in the engineering department, the office of the vice-president and general manager, correspondent and pass clerk in the president's office and the last five years as chief clerk to the purchasing agent. From August, 1923, to February, 1924, he was manager railway sales for the Dallas Hardware Company of Dallas, Texas, and then resigned to go as railway salesman with the E. I. duPont de Nemours & Co., with headquarters at Kansas City, Mo.

William T. Kilborn, assistant sales manager of the **Graham Bolt & Nut Company,** Pittsburgh, Pa., has been appointed general sales manager. Mr. Kilborn is a graduate of Andover Academy and during the World War served

W. T. Kilborn

overseas as first lieutenant in the field artillery. After leaving the service, he became associated with Charles J. Graham in the sales department of the Liberty Steel Products Company and later the American Railway Appliances Company. Mr. Kilborn then served as assistant sales manager of the Graham Bolt & Nut Company, at Pittsburgh, which position he held until his recent appointment as general sales manager, as above noted.

F. R. McMillan, manager of the structural and technical bureau of the **Portland Cement Association,** has been appointed director of research in charge of all investigations in cement and concrete, to succeed Duff A. Abrams, who has resigned to engage in private practice. Mr. McMillan graduated from the University of Minnesota with the degree of civil engineering in 1905 and has been connected with the association since April, 1924. Prior to that time he had been in consulting practice in Minneapolis on the staff of the Frederick Construction Company, New York, and in charge of concrete ship design for the government during the war. For nine years he was on the faculty of the University of Minnesota in charge of concrete design in the concrete laboratory. Mr. Abrams graduated from the University of Illinois in 1905. In that year he became attached to the engineering experiment station of the University of Illinois, and in 1912, became professor in charge of structural materials research of Lewis Institute, Chicago, which in 1916 was taken over by the Portland Cement Association.

Cut-Off & Speed Recorder Corporation

The Cut-Off & Speed Recorder Corporation, 342 Madison avenue, New York, has acquired an exclusive license to operate under the patents owned by the Distance-Speed Recording Company. In addition, it has acquired by lease from the latter company its machinery and equipment used in the manufacture of the loco recorder and it has also acquired the stock of maintenance and service parts. The Distance-Speed Recording Company and its president, J. E. Matthews, have withdrawn from the manufacture, sale and servicing of loco recorders, loco valve pilots, etc., thereby retiring from this field. The Cut-Off & Speed Recorder Corporation will also devote its activities to the promotion and sale of the loco valve pilot which is a combination of a loco recorder with an apparatus and device currently indicating to the engineman in the locomotive cab the position of the cut-off.

Timken Roller Bearing Company

The annual report of the Timken Roller Bearing Company for the year ending December 31, 1926, shows net profits from sales, with other net income, of $8,474,103, after reserve for depreciation and federal taxes. Cash dividends were paid during the year to the amount of $5,403,969. A balance of $3,045,120 was transferred to surplus account. Excerpts from President H. H. Timken's remarks to stockholders follow:

"We wish to make a brief statement about the use of Timken Bearings in railroad service. For about six years Timken Bearings have been successfully used in mine rail cars throughout the mining industry, over 40,000 mine cars being now equipped with Timken Bearings. The service is of course severe, but not comparable to railroad service, the loads carried ranging from 5 to 10 tons.

"The steam railroads have for some time been using gasoline rail cars for certain kinds of service, and to date the great majority of this type of railroad equipment is successfully equipped with Timken Bearings in the car journals as well as in other parts of the car. About 500 of these Timken-equipped cars have been in operation for several years on all the principal railroads in the United States. These cars operate at high speeds but do not weigh quite as much as the standard railway coaches.

"Our first large order for passenger car bearings was obtained in the fall of 1926 from the Chicago, Milwaukee & St. Paul for 63 new Pullman cars and 64 cars of Chicago, Milwaukee & St. Paul ownership, coaches, dining cars, baggage cars, etc., making 12 complete trains. This will be the first time in the history of an American railroad that complete transcontinental trains will be equipped with roller bearings."

Chicago Pneumatic Tool Company

The Chicago Pneumatic Tool Company's annual report for 1926 shows net profit after depreciation, interest and allowance for federal taxes of $1,226,837 as compared with $716,494 in 1925. The comparative income statement follows:

	1926	1925
Net profits after providing for depreciation and for federal taxes	$1,265,082	$722,906
Add: Miscellaneous income	59,528	58,526
	$1,324,611	$781,431
Deduct: Interest on borrowed money	97,774	64,937
Net profit transferred to surplus	$1.226,837	$716,494

Interstate Iron & Steel Company

The annual report of the Interstate Iron & Steel Company, Chicago, for the year ending December 31, 1926, shows a net profit for the year of $900,278, as compared with $1,108,104 in 1925. The reserve for plant and roll depreciation amounted to $523,349, compared with $483,521 in 1925. Interest on bonds and notes paid and accrued totaled $275,933, as compared with $287,479, and the discount and expense on the bond issue written off during the year $23,417, compared with $26,881 in 1925. Earnings, after deducting all expenses and reserves except depreciation and interest and expense, amounted to $1,722,978, as compared with $2,168,805 in 1925. Assets and liabilities amounted to $14,584,290, compared with $14,962,456 in 1925. Land, buildings, plant, machinery, furniture and fixtures amounted to $10,021,289, as compared with $10,425,591 in 1925, and current assets $4,316,474, as compared with $4,240,712, while deferred charges amounted to $246,526, compared with $296,152. Capital liabilities amounted to $1,464,400, compared with $1,880,200; common stock authorized and issued remained at $4,000,000; first mortgage sinking fund gold bonds $3,800,000, compared with $3,353,400; current liabilities $936,393, compared with $1,360,640; reserves $59,793, compared with $359,793; and surplus $4,323,702, compared with $4,008,422.

Dividends at the rate of 22½ per cent were paid on the preferred stock, of which 7 per cent represents the regular dividend accrued for 1926, and of which 15½ per cent represents the entire balance of dividends in arrears accrued prior to September 1, 1924. A new first mortgage of an issue limited to $10,000,000 was authorized during the year, and through the sale of $4,000,000 of 20-year 5½ per cent bonds the outstanding 8 per cent bonds of the company were retired. Two hundred thousand dollars of the 5½ per cent bonds have since been repurchased and are held in the treasury, leaving $3,800,000 outstanding, which are the only funded debt of the company.

Private Printer-Telegraph Service Used Between General Sales Office and Plant

The Long-Bell Lumber Company has established a private printer-telegraph service between its general sales office at Kansas City, Mo., its Douglas fir lumber manufacturing plant at Longview, Wash., and its California white pine manufacturing plants at Weed, Cal., in order to facilitate the handling of rush orders and other business. By means of this equipment rush shipments from California have been speeded up an average of five days. It is not uncommon for the Kansas City office to receive an order in the morning, transmit it to the Longview or Weed plants by wire, and then advise the customer of the car number on the afternoon of the same day. The telegraph has also been used for conferences among officers of the company. Frequently an officer at Kansas City, one at Longview and one at Weed carry on a three-cornered conversation and when the matter is closed each has a type-written copy of all that was said during the conference. During a recent conference between Kansas City and Longview it was estimated that at least three weeks' time had been saved.

Lumber orders usually are of such a nature that they must be transcribed to the mills in a complicated form. With the printer-telegraph these orders are typed in regular form and are received by the mill in the same form. Each of the three offices is equipped with two machines, one being held for emergencies. By the use of these printer-telegraph machines, typewritten messages are sent and received as such and the transmission is practically instantaneous. The rate of transmission is about 40 words a minute.

During the month of January, 1927, a total of 35,000 typewritter lines, or a total of 350,000 words, were transmitted by the company over its private wire. Included in this total there were 561 rush orders for lumber.

American Steel Foundries

The annual report for 1926 shows net income of $4,675,596 as compared with $4,669,737 in 1925. The condensed income statement with comparisons with 1925 follows:

	1926	1925
Earnings from operations, after deducting manufacturing, selling and administrative expenses and federal taxes	$5,173,448	$5,402,378
Deduct: Depreciation	893,824	1,076,733
Net profit from operations	$4,279,624	$4,325,645
Add — Miscellaneous income:		
Interest, discount and exchange, etc.	106,134	177,110
Income from investments	316,129	347,731
	$422,263	$524,841
Total profit and income	$4,701,887	$4,850,485
Deduct: Net earnings of subsidiary company appertaining to outstanding minority stockholdings	26,092	180,748
Net income carried to surplus	$4,675,796	$4,669,737

R. P. Lamont, president, in his remarks to stockholders said in part:

"The volume of rolling equipment bought by the railroads in 1926 was smaller than in 1925 and—with two exceptions—was probably less than for any other year in 25 years. This is certainly true as far as numbers of cars and locomotives are concerned. It is also true that the average annual number of cars and locomotives bought since 1920 is less than half the number bought per year from 1900 to 1910. Nevertheless, the railroads satisfactorily handled the largest volume of traffic in their history.

"Various reasons account for this remarkable situation, among them—the more efficient operation of the railroads,—the larger capacity and better cars and locomotives manufactured in recent years, together with the fact that a considerable percentage of the short haul business has been gradually taken over by automobiles and autotrucks, thus releasing large numbers of cars for more profitable long haul business.

"The actual number of freight cars in existence today is almost exactly the same as it was in 1914, but the total carrying capacity of the cars in existence now is 15 per cent greater than it was 12 years ago.

"It is difficult to estimate when the economic balance will be reached between the automobile and the railroad cars, or—in other words—when the automobile will have absorbed all of the short haul transportation business it can economically handle, but after this point has been reached and the railroads have absorbed all of the cars so released and made available for the longer haul business, then the annual buying of equipment will again have to equal the average number of cars and locomotives which have become obsolete and have been destroyed, together with such additional numbers as may be necessary to take care of the normal annual increase in the business of the country.

"In the meantime, there are practical limitations to the sizes of cars and locomotives and also to the length of time they can be safely and economically used; though no doubt a steel car will last considerably longer than a wooden car.

"There are too many unknown quantities in the equation for an exact solution, but after considering and balancing all of the factors, it seems reasonable to conclude that the railroads will continue to handle the bulk of the transportation of the country and that the business of supplying and maintaining the needed equipment will continue to be a large business, though temporarily curtailed by the coming of the automobile into the transportation field. . . .

"Cash dividends of 7 per cent on the preferred stock (except as to that retired) and $3.00 per share on the common stock were declared and paid during the year.

"The tonnage of unfilled orders on hand at the end of the year was only about 50 per cent of that carried over from the previous year.

"Our business, while it comes almost entirely from the railroads, is largely influenced by and is dependent upon the general business situation, for, in the long run, this determines the amount of railroad buying.

"The people of this country are generally employed at good wages,—we have a great Federal Reserve system,—there are ample credit facilities for all legitimate business,—money is cheap and likely to continue so for some time. There is nothing in sight at the moment to cause any serious change in these conditions, except possibly a strike of the bituminous coal miners April 1—and, of course, the agricultural situation is always important and influential in determining the course of general business.

"As far as one can see now, there is reason to be hopeful for about an average year."

Obituary

Charles F. McCuen, manager of sales of W. H. Miner, Inc., Chicago, Ill., died on February 26 in the Presbyterian hospital, Pittsburgh, Pa.

W. O. Winston, chairman of the board of directors of Winston Brothers Company, Minneapolis, Minn., died on March 15, at Los Angeles, Cal.

Trade Publications

INTERLOCKING CONCRETE CRIBBING.—The R. C. Products Company, Cleveland, Ohio, in a 16-page booklet just issued, describes the advantages of its interlocking concrete crib units for the construction of either permanent or temporary retaining walls. The booklet is illustrated with installations by different railroads in various parts of the country, and the construction of the units, together with the method of erection, is shown in detail.

SPECIFICATIONS FOR RAILS AND FASTENINGS.—The Robert W. Hunt Company, Chicago, has prepared for distribution an 82-page booklet containing the specifications of the American Railway Engineering Association and the American Society for Testing Materials for open-hearth carbon steel rails, carbon steel tee and girder rails, joint bars, track bolts of carbon and alloy steel, track spikes, steel and wrought iron tie plates, and spring washers. The booklet is attractively prepared and brings together in convenient form the standard specifications for track materials.

FIFTY YEARS OF SERVICE.—The Western Wheeled Scraper Co., Aurora, Ill., has just issued an attractive jubilee catalogue in honor of its fiftieth birthday, the company having been founded in 1877. This catalogue, which is designated No. 70 and contains 168 pages, is divided into three distinct sections; a brochure section that deals with the history of the company and its relation to the earth moving industry, and parts one and two, which attractively describe and illustrate the various types of western dump cars and all of the other types of equipment and machinery manufactured by this company for handling earth and stone.

ELECTRIC FURNACES FOR LABORATORIES AND SHOPS.—Electric furnaces, designed for general use in chemical and physical laboratories in connection with the heat-treatment of materials, incinerations, ash and fusion determinations and research and experimental work generally, are described and illustrated in a 16-page bulletin issued by Automatic & Electric Furnaces, Ltd., Elecfurn Works, Farringdon Road, E. C. 1, London, England. The furnaces are manufactured with heating chambers of three standard patterns. All the furnaces are suitable for temperatures up to 1,000 deg. C. and can be operated on either alternating or direct current of any standard voltage.

Union Pacific No. 16 Near Omaha, Neb.

Construction

ATCHISON, TOPEKA & SANTA FE.—A contract has been awarded to the Cameron-Joyce Company, Keokuk, Ia., for the grading in connection with seven miles of realignment at Mulvane, Kan. A contract for the construction of second main track between Defiance, N. Mex., and Chambers, 40 miles, has been let to W. A. Bechtel, San Francisco, Cal.

BIRMINGHAM SOUTHERN.—This company has applied to the Interstate Commerce Commission for authority to build an extension of 2.4 miles at Birmingham, Ala.

BOSTON & MAINE.—A contract has been awarded to Dwight P. Robinson & Co. for the erection of a new fruit exchange building at Boston, Mass., which is estimated will cost $350,000.

CANADIAN PACIFIC.—This company has advanced $95,000 as its share in the construction of a hotel at Nanaimo, B. C., which will contain 80 guest rooms and will involve a total expenditure of about $220,000.

CHESAPEAKE & OHIO.—The Hocking Valley is asking for bids for the construction of water-treating plants and pumping stations at Ruble, Ohio and Circleville.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been let to W. H. Denison, Cushman, Ark., for the construction of an extension north of Amarillo, Tex., from a point five miles south of the Canadian river, north 18 miles, passing through Stinnett, Tex.

LOUISVILLE & NASHVILLE.—This company has awarded a contract to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., for the construction of a bridge over the Mobile River near Mobile, Ala. The bridge, whose superstructure will be fabricated by the American Bridge Company, Chicago, will consist of three fixed through spans, one through plate girder span and one 330-ft. draw span.

MAINE CENTRAL.—A contract has been awarded to Fairbanks, Morse & Co., of Chicago, Ill., for the construction of a mechanical coal handling plant at Calais, Maine. Another contract has been let to the Chicago Bridge & Iron Works for the construction of a 50,000 gal. capacity water tank at Calais, Maine. The above projects are estimated to cost about $40,000.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company's budget for 1927 provides for the enlargement of Schiller yard at Chicago at a cost of about $525,000, the expenditure of $100,000 for terminal improvement at Chicago and an expenditure of a like amount for reduction of grades on the Chicago division.

MISSOURI PACIFIC.—Plans have been prepared for the construction of 10 miles of second main track between Curtis, Ark., and Bierne, estimated to cost $863,000.

PERRY & SOUTHEASTERN.—The Interstate Commerce Commission has made public a report proposed by Examiner R. M. Brown, recommending a finding by the commission that public convenience and necessity have not been shown to require the construction and operation by this company of a line from Clinchfield to Perry, Ga., 7.6 miles, and a proposed issue of stock of $250,000. The stock would be delivered to the Pennsylvania Dixie Portland Cement Corporation. The examiner says that while the line would be of material advantage to the cement company, the record is convincing that such advantage would not be in the public interest.

SAN BENITO & RIO GRANDE VALLEY.—This company has applied to the Interstate Commerce Commission for authority to build an extension from a point near La Paloma, Tex., in a general southeasterly direction, approximately 15 miles.

ST. LOUIS-SAN FRANCISCO.—A contract has been awarded to the Virginia Bridge & Iron Company of Roanoke, Va., for the construction of various bridges at Pensacola Extension, Fla., at an estimated cost of $37,000.

ST. LOUIS-SAN FRANCISCO.—Contracts have been awarded to Reed & Lowe, Birmingham, Ala., for the grading in connection with the construction of mechanical department facilities at Yale, Tenn., and to the Layne Central Company, Memphis, Tenn., for the drilling of two deep wells of a capacity of 1,000 gal. per min. The latter work will cost about $20,000.

SEABOARD-ALL FLORIDA.—The Interstate Commerce Commission has granted an extension to June 1 for the completion of the lines from Palm Beach to Florida City and from Fort Myers toward La Belle, Fla., under the certificates issued by the commission.

SOUTHERN PACIFIC.—This road has awarded a contract to the Worden Henry Construction Company for the construction of a stucco freight station at Harlingen, Texas, estimated to cost $20,000.

SOUTHERN PACIFIC.—A contract has been let to W. M. Parker for the construction of a one-story frame and stucco combined passenger and freight station at Liberty, Tex., to cost about $30,000.

TEXAS & PACIFIC.—A contract for the grading work incidental to the construction of yard and terminal facilities at Ft. Worth, Tex., has been awarded to the D. A. Foley Construction Company, Los Angeles, Cal. This contract involves the excavation of about 1,000,000 cu. yds. of earth. The project will also include the construction of about 53 miles of track and a bridge over the Clear Fork of the Trinity River.

WABASH.—This company plans the construction of a 10-stall roundhouse, a 100-ft. turntable, a water tank and a trainmen's service building at Ft. Wayne, Ind., at a cost of about $200,000.

Railway Finance

ATLANTIC COAST LINE.—*Bonds Authorized.*—The Interstate Commerce Commission has authorized this company to issue $8,809,000 general unified 50-year, series A, 4½ per cent bonds to be sold to J. P. Morgan & Co. at not less than 94½. The company proposes to call on May 15, 1927, $6,000,000 secured gold notes dated May 27, 1920, and thereby obtain the release of $10,000,000 general unified bonds now held as collateral security for these notes and to sell $8,809,000 of the bonds thus released from pledge and apply the proceeds thereof in reimbursement of its treasury for expenditures in retiring the prior bonds of its predecessor and constituent companies, etc.

BLACK MOUNTAIN.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon that portion of its railroad extending from the point of connection of the Bowlens Creek branch with the main line, to the south end of the main line near Eskota, 11.826 miles, all in Yancey County, N. C. The North Carolina Commission made recommendations that it would be an economic waste to continue operation of this line. The road's chief traffic was lumber.

CANADIAN PACIFIC.—1926 *Earnings.*—A preliminary statement of 1926 earnings shows net income after interest and other fixed charges of $40,725,039 equivalent after allowance for preferred dividends to $14.12. Net income in 1925 was $36,573,634 or $12.52 a share.

To Issue Common Stock.—Notice was issued on March 16 that authorization for the issue of additional common stock would be sought from the shareholders at a special meeting to be held concurrently with the annual general meeting on May 4. The notice said:

"The meeting will be made special for the purpose of considering, and, if approved, of authorizing the issue of the additional $75,000,000 ordinary capital stock approved by the governor-in-council on November 7, 1913, and sanctioned by the shareholders at a special meeting held on October 7, 1914, in such amounts, on such terms and at such times as the directors shall from time to time decide."

CHICAGO, MILWAUKEE & ST. PAUL.—*Appeal Denied in Sale.*—The bondholders' protective committee of the Chicago, Milwaukee & St. Paul was denied permission to appeal from the order issued by Federal Judge James H. Wilkerson on January 19, which confirmed the sale of the road on March 14. At the same time, Judge Wilkerson denied two other motions, asking for a severance of the interest of minority bondholders from the trustees of the railroad and for an injunction restraining the disposition of the new securities assignable under the reorganization plan to the minority committee's bonds.

In denying the motions Judge Wilkerson said that if the minority bondholders have a right to appeal their only right is in respect to the equity of the reorganization plan. He said that their appeal was against the entire order of January 19 and their assignments of error included matters which had been decided against them by him, the circuit court of appeals and the United States Supreme Court. The court held that the committee has no right of severance because it was not a full party to the cause and its right to be a party had been overruled by the Supreme court. The request for an injunction was denied because it had been bound with the question of an appeal.

CHICAGO, ROCK ISLAND & PACIFIC.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to acquire a line now owned by the Minneapolis & St. Louis from Albert Lea, Minn., to the Iowa state line, about 12 miles. It proposes to finance the purchase by paying $150,000 of M. & St. L. 7 per cent bonds, due June 1.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bonds Authorized.*—The Interstate Commerce Commission has authorized this company to issue $833,000 general mortgage bonds, to be delivered to the trustee under the first and refunding mortgage; and to issue $833,000 first and refunding mortgage bonds to be pledged and repledged as collateral security for short term notes.

DETROIT & MACKINAC.—*Allowed to Intervene in Merger Case.*—The Interstate Commerce Commission has granted this company's petition for leave to intervene in the proceedings on the application of the Chesapeake & Ohio for authority to acquire control of the Pere Marquette and Erie.

FRANKFORT & CINCINNATI RAILROAD.—*Reorganization.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of and to operate the line of the old railway company of the same name, from Frankfort, Ky., to Paris, 41 miles, which it purchased under foreclosure on January 1, and to issue $40,000 of stock.

GEORGIA & FLORIDA.—*I. C. C. Approves Reorganization Expenses.*—In its original order in the proceedings relative to the reorganization of the Georgia & Florida issued December 23, 1926, the Interstate Commerce Commission deferred action on that part of the carrier's application which related to the issuance of securities for the purpose of defraying expenses of the reorganization and of winding up the receivership until the carrier should have filed an itemized statement of the amounts actually required with a description of the services covered, etc. The carrier has since filed this information and the commission has removed the restriction contained in its previous order.

LENOX.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its line from Redwine, Morgan County, Ky., to a point on Rush Branch, 7.7 miles. The Kentucky Railroad Commission recommended that the carrier's application for abandonment be granted. The reason for abandonment was lack of tonnage.

MIDLAND VALLEY.—*Bonds Authorized.*—The Interstate Commerce Commission has authorized this company to issue $198,000 first mortgage 5 per cent bonds to be sold at not less than 90 or to be pledged and re-pledged as collateral security for short term notes. The carrier's application called for an amount of $446,000 but the commission only allowed the smaller amount.

MINNEAPOLIS & ST. LOUIS.—*Stockholders May Withdraw Stock.*—The Stockholders' Protective Committee has notified holders of certificates of deposit that they will be permitted to withdraw their stock from deposit by paying 15 cents a share. The committee said that it would continue to function in the interests of the stockholders but added that the failure of the road to improve under receivership has postponed the working out of a re-organization plan. The letter to the holders of certificates of deposit also said that "in addition to the possibilities of an improved showing in the operation of the property, the present tendency toward the consolidation of carriers will, it is hoped, offer to your committee an opportunity to urge the inclusion of your property in one of the larger systems which are now reported to be in process of formation."

NEW CASTLE & OHIO RIVER.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its line from Hanging Rock, Lawrence County, O., to New Castle, 3.5 miles.

PENNSYLVANIA.—*Bonds.*—The Pennsylvania, Ohio & Detroit has applied to the Interstate Commerce Commission for authority to issue $22,000,000 of first and refunding mortgage 4½ per cent bonds, to be delivered to the Pennsylvania for indebtedness due it as lessee. The Pennsylvania has also applied for authority to guarantee the bonds and to sell them on receipt. The Northern Central has applied for authority to change the interest rate on $5,231,000 of general and refunding mortgage bonds authorized by the commission last year from 5 to 4½ per cent, and the Pennsylvania has applied for authority to assume obligation and liability as lessee and to sell the bonds. The public offering of these bonds was reported in the *Railway Age* of March 12.

READING COMPANY.—*Assumption of Obligation.*—The Interstate Commerce Commission has granted authority to the Reading Company to assume obligation and liability, as guarantor, in respect of $3,000,000, principal amount, of Philadelphia Grain Elevator Company first mortgage 5 per cent bonds. This company is erecting a modern elevator plant for the handling of export grain at Philadelphia.

RUTLAND.—*New Director.*—W. Seward Webb has been elected a director succeeding P. W. Clement, deceased.

SEABOARD-ALL FLORIDA.—*Bonds Authorized.*—The Interstate Commerce Commission has granted authority to the Florida Western & Northern, the East & West Coast and the Seaboard-All Florida to issue jointly $2,194,000 Seaboard-All Florida first mortgage 6 per cent bonds, series B, to be delivered to the Seaboard Air Line in re-imbursement of an equal amount of advances made by that company to the Florida Western & Northern for capital purposes; and has authorized the Seaboard Air Line to assume obligation and liability by endorsement.

TOLEDO & OHIO CENTRAL.—*New Director.*—Louis S. Emery has been elected a director succeeding F. B. Sheldon, deceased.

TOLEDO-DETROIT.—This company has applied to the Interstate Commerce Commission for authority to abandon its line from a connection with the New York Central at Dundee Township, Mich., to a connection with the Detroit, Toledo & Ironton, 6.98 miles.

WABASH.—*Dividend on Preferred Stock.*—Directors on March 2 declared an initial dividend of 5 per cent on the preferred B stock, payable April 1 to stockholders of record March 19. This stock is 5 per cent non-cumulative. It has the privilege of conversion into half preferred A, which pays 5 per cent dividends, and half common, and inasmuch as the better part of the original issue has been so converted there is only a small amount outstanding.

Average Price of Stocks and Bonds

	Mar. 15	Last week	Last year
Average price of 20 representative railway stocks.	106.63	105.36	90.95
Average price of 20 representative railway bonds.	99.01	98.63	95.96

Dividends Declared

Beech Creek.—½ per cent, quarterly, payable April 1 to holders of record March 15.

Boston Revere Beach & Lynn.—1½ per cent, quarterly, payable April 1 to holders of record March 15.

Joliet & Chicago.—1¾ per cent, quarterly, payable April 4 to holders of record March 25.

New York Central.—1¾ per cent, quarterly, payable My 2 to holders of record March 31.

Pittsburgh, Bessemer & Lake Erie.—Common, $0.75, payable April 1 to holders of record March 15.

Southern Railway.—Common, 1¾ per cent, quarterly, payable May 2 to holders of record April 2. Preferred, 1¼ per cent, quarterly, payable April 15 to holders of record March 22.

Wabash.—Convertible preferred B, 5 per cent, payable April 1 to holders of record March 19.

Western Pacific.—Preferred, $1.50, quarterly, payable April 6 to holders of record March 25.

Valuation Reports

The Interstate Commerce Commission has issued final or tentative valuation reports finding the final valuation for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows:

Final Reports

Washington & Lincolnton.....	$194,000	1918
Aliquippa & Southern.....	1,243,407	1916
Saratoga & Encampment.....	631,173	1919

Tentative Reports

Alabama, Tennessee & Northern.	$2,204,700	1918
Owasco River	133,287	1917
Lake Erie & Eastern.....	4,925,000	1916
Benwood & Wheeling Connecting	305,000	1918

Railway Officers

Executive

J. A. Jackson, vice-president of the Wichita Falls, Ranger & Fort Worth, has been elected president, with headquarters at New York, succeeding **J. W. Mitchell**, appointed vice-president, with headquarters at Ft. Worth, Tex. **William H. Larsen**, assistant general manager, with headquarters at Ranger, Tex., has been elected vice-president and general manager, taking over the duties as general manager heretofore performed by Mr. Mitchell.

Financial, Legal and Accounting

Reba Zimmerman has been appointed treasurer of the Oklahoma, with headquarters at Oklahoma City, Okla., succeeding **E. J. Richert**, resigned.

J. F. Forner has been appointed statistician for operations of the Delaware & Hudson, with headquarters at Albany, N. Y., succeeding **H. F. Zimmerman**, deceased.

W. J. Spaulding has been appointed acting auditor and general freight agent of the Tennesssee, with headquarters at Oneida, Tenn., succeeding **C. H. Schulken**, who is on leave of absence.

Operating

Charles D. Kinney has been appointed general superintendent in full charge of the operating department of the Boyne City, Gaylord & Alpena, with headquarters at Boyne City, Mich.

Linneaus D. Hickey, acting assistant superintendent of the Port Arthur division of the Manitoba district of the Canadian National, with headquarters at Rainy River, Ont., has been appointed assistant superintendent at that point.

L. A. David, general superintendent of the International-Great Northern, with jurisdiction over the Houston, Palestine and San Antonio divisions and the Houston terminal, has been promoted to assistant general manager of the Texas lines of the Missouri Pacific, with headquarters as before at Houston, Tex., and the position of general superintendent at Houston has been abolished .

F. A. Lehman, general manager of the Atchison, Topeka & Santa Fe, Western Lines, with headquarters at Amarillo, Texas, has been transferred to Topeka, Kan., succeeding **F. C. Fox**, general manager of the Eastern Lines, retired (effective April 1). **R. H. Allison**, assistant general manager of the Eastern Lines, with headquarters at Topeka, has been appointed general manager of the Western Lines, succeeding Mr. Lehman.

I. B. Sinclair, superintendent of the Conemaugh division of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been appointed superintendent of the Middle division, with headquarters at Altoona, Pa. **G. M. Sixsmith**, superintendent passenger transportation, Central Region, with headquarters at Pittsburgh, Pa., succeeds Mr. Sinclair as superintendent of the Conemaugh division. **T. J. Jelbart**, trainmaster of the Buffalo division, has been appointed superintendent passenger transportation, Central Region, with headquarters at Pittsburgh, succeeding Mr. Sixsmith. **J. S. Peoples**, assistant trainmaster of the Pittsburgh division, has been appointed trainmaster of the Buffalo division. **W. C. Downing**, general agent and superintendent of the Indianapolis division, has been appointed general agent, with headquarters at Indianapolis, Ind. **R. R. Nace**, superintendent of the Schuylkill division, with headquarters at Reading, Pa., has been appointed superintendent of the Indianapolis division, with headquarters at Indianapolis. **F. L. Dobson**, assistant superintendent of the New York division, with headquarters at Jersey City, N. J., has been appointed superintendent of the Schuylkill division. **H. A. Hobson**, trainmaster of the Renovo division, has been appointed assistant superintendent of the New York division. **W. R. Triem**, assistant trainmaster of the Pittsburgh division, has been appointed trainmaster of the Renovo division. **B. H. Hudson**, superintendent of the Logansport division, with headquarters at Logansport, Ind., has been appointed superintendent of the Sunbury division, succeeding **L. W. Allibone**, retired under pension regulations.

Traffic

J. E. W. Thomas has been appointed general agent of the Toledo, Peoria & Western, with headquarters at Dallas, Tex.

R. L. McKnight has been appointed general agent of the Union Pacific at Ogden, Utah, succeeding **W. H. Chevers**, deceased.

Hal Shaffer, treasurer of the Caddo & Choctaw, has been appointed general freight agent, with headquarters at Kansas City, Mo.

R. C. Haase has been appointed assistant general passenger agent of the Baltimore & Ohio, with headquarters at Philadelphia, Pa.

D. P. Grier has been appointed general western agent of the Seaboard Air

Line, with headquarters at Chicago, Ill., succeeding J. G. Cantrell, deceased.

Nicholas Baker has been appointed assistant general freight and passenger agent of the Boyne City, Gaylord & Alpena, with headquarters at Boyne City, Mich.

William H. Turner, general agent in the freight department of the New York, Chicago & St. Louis, has been placed in charge of an office opened at Akron, Ohio.

F. J. Vanderblue, assistant to the general freight agent of the Chesapeake & Ohio, at Chicago, has been promoted to assistant general freight agent, with the same headquarters.

Oliver L. Crawford, traveling agent for the Rutland, with headquarters at Chicago, has been appointed general agent in the same city, succeeding **C. B. Newcomb,** deceased.

E. A. Turner, traveling freight agent of the Southern Pacific, with headquarters at Memphis, Tenn., has been appointed assistant general passenger agent, with headquarters at New Orleans, La.

C. H. Guion, general freight agent of the International-Great Northern and the Gulf Coast Lines, with headquarters at Houston, Tex., has been appointed freight traffic manager, with headquarters in the same city, and the position of general freight agent at Houston has been abolished.

Irwin Wapple, general agent of the Texas & Pacific at Los Angeles, Cal., has been appointed assistant traffic manager, with headquarters in the same city. **A. T. Pratt,** general agent at San Francisco, Cal., has been appointed assistant traffic manager, with headquarters in the same city.

Mechanical

H. F. Derner, general foreman, car department of the Indiana Harbor Belt, with headquarters at Gibson, Ind., has been appointed general inspector, car department of the Boston & Maine, with headquarters at Boston, Mass. **Malcolm Morrison,** division car foreman of the Boston & Maine, with headquarters at Concord, N. H., has been appointed general inspector, car department, with headquarters at Portland, Maine.

Arthur Carr has been appointed road foreman of engines of the Pacific lines of the Southern Pacific, with headquarters at Dunsmuir, Cal., succeeding **W. C. Davis,** transferred to the Stockton division, with headquarters at Tracy, Cal. Mr. Davis succeeds **G. B. Jefferis,** who has retired under the pension rules of the company. **W. G. Fifield,** assistant road foreman of engines on the Coast division, with headquarters at San Francisco, Cal., has been appointed road foreman of engines at the same point, succeeding **M. I. King,** assigned to other duties.

William C. Lang, who has been appointed master car builder of the Pittsburgh & Lake Erie, with headquarters at McKees Rocks, Pa., was born on January 5, 1881, at Cochranton, Pa. He was educated at the State Normal School at Edinboro, Pa., graduating from there in 1900. He entered railroad service in April, 1903, with the Pittsburgh & Lake Erie, as timekeeper in the office of the master car builder, and became gang foreman in November, 1904. Mr. Lang served as assistant general foreman of car shops from November, 1907, until July, 1915, when he was appointed general car inspector. In January, 1925, he became assistant master car builder, which position he was holding at the time of his recent appointment to master car builder of the Pittsburgh & Lake Erie.

David C. Reid, who has been appointed superintendent of locomotive maintenance of the Boston & Maine, with headquarters at Boston, Mass., was born on April 7, 1890, at Chicago, Ill. He was educated in the public schools at East Chicago, Ind., and entered railroad service in June, 1906, with the Chicago Terminal. For four years he was a machinist's apprentice on this road. He then served with the Elgin, Joliet & Eastern from 1910 until 1911, when he left this road to go with the Hubbard Steel Foundry. During 1912,

David C. Reid

he was in the employ of the Goldschmidt Detinning Company, and then went with the New York Central as a machinist. Mr. Reid became assistant roundhouse foreman in October, 1917; night enginehouse foreman in November, 1917; day enginehouse foreman in December, 1920; general enginehouse foreman in October, 1922, and master mechanic in April, 1926, which latter position he was holding at the time of his appointment as superintendent of locomotive maintenance of the Boston & Maine.

Engineering, Maintenance of Way and Signaling

Harold Rindal, formerly district engineer of the British Columbia district of the Canadian Pacific at Vancouver, B. C., has been appointed chief engineer of the Pacific Great Eastern, with headquarters at Vancouver.

R. E. Sherer, assistant engineer of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Enderlin, N. D., has been appointed division engineer on the Duluth, South Shore & Atlantic, with headquarters at Marquette, Mich.

L. C. Walters, signal and electrical engineer of the Southern Railway, has been appointed signal and electrical superintendent, lines west, with headquarters at Cincinnati, Ohio. The position of signal and electrical engineer has been abolished.

Arthur J. Gayfer, division engineer of the Melville division of the Saskatchewan district of the Canadian National, with headquarters at Melville, Sask., has been appointed division engineer of construction on the Dunblane extension, with headquarters at Dunblane, Sask.

Special

John W. Haw, agricultural development agent on the Northern Pacific, with headquarters at St. Paul Minn., has been appointed to the position of director of the newly created department of agricultural development, a consolidation of the agricultural and immigration departments.

Obituary

Joseph C. Rich, general solicitor of the Gulf, Mobile & Northern, died at Mobile, Ala., on March 8.

James T. Webb, general agent in the freight department of the New York, Chicago & St. Louis since 1920, died on March 1 at his home in Little Rock, Ark.

Patrick F. Shea, assistant superintendent of the Susquehanna division of the Delaware & Hudson, died on March 17, at Binghamton, N. Y., after a cerebral hemorrhage.

Walter J. Thiele, general superintendent of the middle district of the Chicago, Milwaukee & St. Paul, died at Milwaukee, Wis., on March 12 from heart disease. Mr. Thiele was born on May 19, 1873, at Burlington, Wis., and entered railway service on May 1, 1889, as a telegraph operator on the Milwaukee. He was advanced successively from telegraph operator to train dispatcher and then to chief dispatcher and on May 15, 1909, he was promoted to trainmaster at Chicago. On April 15, 1913, Mr. Thiele was promoted to division superintendent, with headquarters at Minneapolis, Minn., where he remained until March 1, 1920, when he was further promoted to general superintendent of the middle district, with headquarters at Milwaukee. At the

time of his death Mr. Thiele had completed 37 years of railroad service, all with the Milwaukee.

William F. Herrin, vice-president and chief counsel of the Southern Pacific, who died at San Francisco, Cal., on February 28, was born on August 7, 1854, near Jacksonville, Ore. He graduated from the Oregon State Agricultural College, Corvallis, Ore., in 1875, and obtained his education in law at Cumberland University, Lebanon, Tenn., graduating in 1875 with the degree of bachelor of laws. Mr. Herrin then practiced law in San Francisco until July 1, 1893, when he was appointed chief counsel of the Southern Pacific, with headquarters in the same city. Shortly after this time he became vice-

W. F. Herrin

president of the California North Eastern and the Pacific Electric in addition to his duties as chief counsel of the Southern Pacific. In March, 1910, he was elected vice-president and chief counsel in charge of the legal and land departments of the latter company, dropping the vice-presidency of the two subsidiary companies in 1912. Mr. Herrin held the position of vice-president and chief counsel continuously until his death.

Frederick Beaumont Sheldon, resident vice-president of the Ohio Central lines of the New York Central who died on March 1, was born January 27, 1856, at Manchester, England, and entered railway service in the United States at the age of 14 as a rear flagman on a survey party on the construction of the Arkansas Central (now a part of the Missouri Pacific). In 1871 he was advanced to draftsman and from May, 1872, to May, 1877, he served successively as topographer, draftsman and assistant engineer on the Columbus & Toledo (now a part of the Hocking Valley). Mr. Sheldon was then promoted to engineer, being appointed, in addition, engineer of the Ohio & West Virginia (merged as the Hocking Valley) in January, 1881. In August of that year he was appointed engineer of the Toledo & Ohio River division of the Columbus, Hocking Valley & Toledo, where he remained until October, 1888, when he was promoted to chief engineer. When that railroad was reorganized as the Hocking Valley he remained as chief engineer, becoming in addition assistant to the president on January 1, 1900, and in the following

F. B. Sheldon

year assistant to the president of the Kanawha & Michigan. Mr. Sheldon dropped his duties as chief engineer of the Hocking Valley in 1905. From November 1, 1910, to January 1, 1915, he served as president of the K. & M., being appointed vice-president of that company, the Toledo & Ohio Central and the Zanesville & Western at the end of that time. In August, 1916, he was also elected vice-president of the Kanawha & West Virginia, becoming resident vice-president of the same lines when they were merged as the Ohio Central lines of the New York Central in 1922, with headquarters at Columbus, Ohio, a position Mr. Sheldon held until his death.

George H. Sines, assistant to the vice-president in charge of operation of the Union Pacific, who died at Omaha, Neb., on March 9, was born on June 9, 1871, at Denton, Mich. After graduation from the Michigan State Normal College, Ypsilanti, Mich., in June, 1892, he entered railway service as a brakeman on the Michigan Central, being advanced successively to conductor and to train rules examiner. While in the train service of the Michigan Central Mr. Sines occupied several offices in the Brotherhood of Railroad Trainmen, including that of local chairman and secretary of the general committee. As a delegate to the Brotherhood convention at Columbus, Ohio, in 1909, he was elected vice-president of that organization, assuming his duties on August 1 of that year. Mr. Sines served as a representative of the employees in train service on several government adjustment agencies, including the "Commission of Eight" and in May, 1918, he was chosen as chairman of the Board of Railroad Wages and Working Conditions of the United States Railroad Administration. At the end of federal control of the railroads he resumed his position as vice-president of the brotherhood, remaining in that capacity until April 9, 1921, when he was appointed assistant to the vice-president of operation of the Union Pacific in charge of labor and personal matters. He remained in this position until his death. Mr. Sines had a keen conception of the importance of human values in industrial relations and a breadth of view that endeared him to all classes of employees and supervisors. He was one of the strong backers of the Y. M. C. A. conferences on human relations held annually at Estes Park, Colo., and headed up the committee on local arrangements in charge of the Triennial Conference of

George H. Sines

the Transportation Department of the Y. M. C. A., and the Fourth International Younger Railroad Men's Conference, which were held at Omaha last November.

THE WAGE DISPUTE between the southeastern railroads and the Brotherhood of Locomotive Firemen & Enginemen, which is asking an increase of $1 per day, has been referred to the Board of Mediation, which has delegated G. W. W. Hanger to conduct negotiations.

On the Union Pacific at Lane, Neb.